MUNICIPAL JOURNAL AND ENGINEER

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VOLUME XII NEW YORK, JANUARY, 1902 No. 1

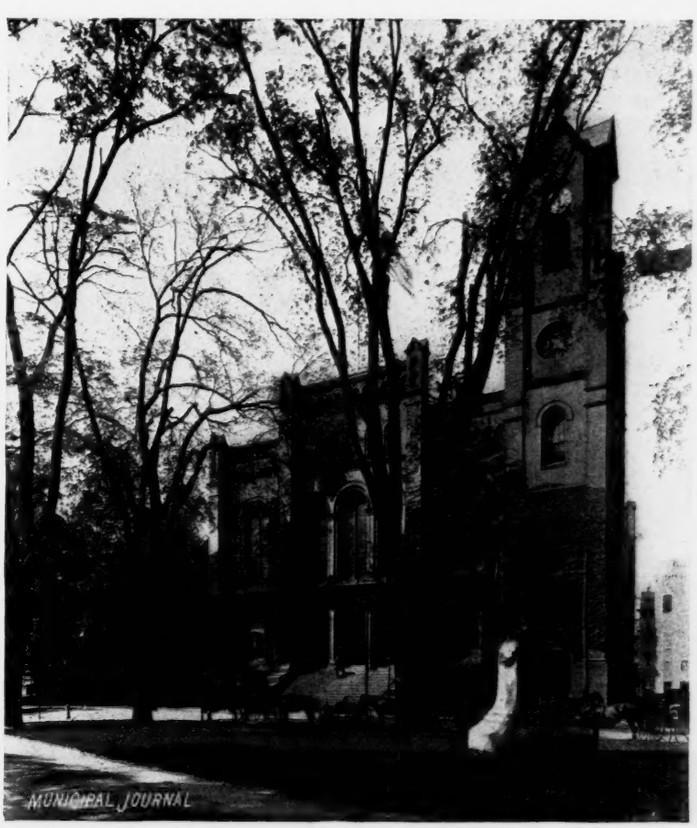
THE STORY OF A NEW ENGLAND CITY

Springfield a Beautiful City—It Needs a New Charter—Has Meagre Returns from Franchises—Financial Standing Equal to the Best—Splendid Pavements—Excellent Water, Fire and Police Departments

By the Editor

THE problem of municipal government in the United States is receiving earnest and increasing attention. A thoughtful study and comparison of American, as well as of foreign civic conditions, will hasten its solution. To take a city, like Springfield, Mass., and describe it from a municipal—not a commercial—standpoint, with reference to its good and bad qualities, as related to some of its near and distant neighbors, cannot fail to be of practical interest and value.

Springfield is a beautiful, overgrown New England village, with just enough of bustle and hustle in its business and manufacturing sections to lend a metropolitan air to its general aspect. As compared with many Western cities its streets are narrow, but they are well constructed and kept in excellent repair. Like most Eastern cities it is well shaded. So numerous are the trees that, from a nearby view from the uplands, the city is almost concealed by the abundant foliage in summer. The magnificent elms in the old part of the town, the well-kept and unfenced lawns, the large number of comfortable and home-like dwellings, the generous area of parks, give a combination of city and country effect, seldom found in so large a municipality. The slum and tenement districts, as they are known to larger cities, are conspicuous for their absence. It is only recently that apartment houses have begun to make their appearance, so that, with a few exceptions, the air and sunlight have free access to every home. Smoke, that bane of manufacturing towns, is threatening to destroy some of the blessings which, hitherto, have been so freely enjoyed. These benefits, together with a large number of department stores, markets and shops—all well stocked—schools, libraries, museums, theatres, etc., have made the city widely known as a delightful place of residence.



SEAT OF SPRINGFIELD'S CITY GOVERNMENT

ITS SYSTEM OF GOVERNMENT

It is governed by a Mayor and a City Council, the latter consisting of a Board of Aldermen of eight members and a Common Council of eighteen members, besides the usual departments, several of which have been created since the incorporation of the city in 1852. The Mayor is vested with unlimited veto power on all legislation, a two-thirds vote being required to pass any measure over his head, but he has few appointive offices of any consequence.

Although nominations are always made by the two old parties, there is a sufficient number of independents in each to always insure the nomination of the most desirable candidates, not only for the executive and administrative, but the legislative offices as well, so that, in any event, good government is sure to result. It has been a time-honored custom to return a faithful administrative officer, whether elected by the people or by the City Council, to his position as long as he may desire it; the mayoralty and councilmanic offices being the only ones subject to partisan contentions. But even in these, party lines are not infrequently disregarded, as for instance, the retiring mayor, Mr. William P. Hayes, a Democrat, was elected a second time by the largest majority ever given in a mayoralty contest. Refusing to stand for a third term, his successor, Mr. Ralph W. Ellis, a Republican, was recently elected by a majority which gave him 67 per cent. of the total vote cast.

MAYOR RALPH W. ELLIS

Paradoxical as it may sound, while nominations are always made by the old parties, the city is really governed on a non-partisan policy.

The present incumbent of the mayor's chair, Mr. Ralph W. Ellis, is a Harvard graduate of the class of '79. He chose the law as his profession, having been admitted to the bar in 1881. He has previously served both his State and his city; the former as the representative of the old Sixth Hampden district in 1893; the latter as a member of the Common Council in '95 and '96, and as a member of the Board of Aldermen in '97 and '98; therefore he comes to his new position of responsibility well equipped and will, doubtless, give a satisfactory administration.

THE GROWTH OF THE CITY

The development of Springfield from a small, straggling town of 10,000 to an influential and progressive city of more than 62,000 inhabitants has been slow but sure. The fostering but critical attention of the local newspapers, which are models of their class, has been largely responsible for the pure administration of this New England municipality. As one of the editors remarked: "Throughout our history as a city, we have not had a 'steal' which has been large enough to see."

In its civic adornment, quality rather than quantity has been sought after, and for this reason there have been comparatively no serious blunders either in the designing or location of its public buildings, monuments or statues. Among the statues is one, by J. S. Hartley, representing Miles E. Morgan, one of the early settlers, which was presented to the city by Mr. Henry T. Morgan, of New York. It is located directly in front of the City Hall, as seen in the illustration on the first page. Among the treasured early records of Springfield, in connection with the subject of this work of art, is his signature, which is appended to a record of a meeting to "settle some things about a mill." Not the least interesting fact in this connection is that he could not write his name, and so made his mark, which bears a resemblance to an anchor. Mr. J. Pierpont Morgan, of New York, is a descendant of this same Miles E. Morgan.

The most notable work of sculpture is that known as "The Puritan," by the celebrated Augustus St. Gaudens, who has just returned to this country after an extended absence abroad. This is a memorial to Deacon Samuel Chapin, an early settler of the town, and is located on Merrick Terrace, where its beauty is shown to the greatest advantage.

Municipal art is the neglected side of American civic development; purposely so because it is deemed impractical by the multitude. But a greater mistake could not be made. The adornment of a city, when projected in a careful and systematic manner, is always a good business investment. At this stage of the game, however, Springfield, like other American towns, must depend largely, if not wholly, upon the gifts of public-spirited citizens. And at the same time every municipality can contribute its share to civic beauty, without calling upon the public treasury to any appreciable extent. It comes strictly within the province of the city government to furnish well paved and clean streets. Not only the streets, parks, small squares, public buildings and grounds, but the front and back yards of residences, rightfully come under the supervision of a wise and thoughtful municipal administration. The corporations, also, such as the railroads, electric and steam, large manufacturing concerns, warehouses and the like are generally willing to perform their part in an endeavor to beautify their grounds and buildings. Springfield has such a large number of public-spirited citizens that the work of local improvement organization is made comparatively easy. Civic pride is developing rapidly and satisfactorily.

THE NEW SCIENCE BUILDING

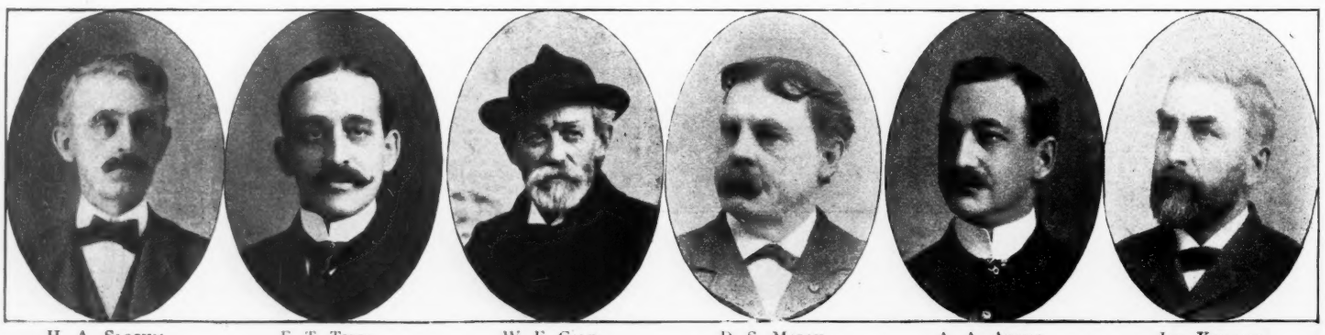
TABLE SHOWING POPULATION AND ASSETS OF SEVEN CITIES

	Population, 1900.	Cash in treasury.	Cash and bonds in sinking fund.	City hall.*	Police dept.*	Fire dept.*	Schools.*	Libraries.*	Parks.*	Total assets.
Lawrence, Mass.	62,599	$50,910	$356,083	$114,000	$45,000	$175,000	$869,419	$90,000	$529,350	$4,590,527
New Bedford, Mass.	62,442	50,911	843,989	145,966	82,248	227,015	843,875	188,839	165,376	5,706,933
Des Moines, Ia.	62,139	231,252	70,091	67,765	5,000	204,400	981,659	163,165	200,109	2,220,867
Springfield, Mass.	62,059	326,664	595,283	136,400	93,440	305,755	1,856,708	.....	648,176	6,393,633
Somerville, Mass.	61,643	103,859	.....	72,250	48,000	231,028	1,111,344	73,484	445,326	3,313,155
Troy, N. Y.	60,651	51,397	25,087	300,000	40,600	326,000	694,000	.....	167,000	2,711,784
Hoboken, N. J.	59,364	55,207	133,887	266,000	38,350	219,120	710,000	130,000	350,700	2,278,264

* Including land, buildings, apparatus, etc.

FINANCIAL STANDING AMONG THE BEST

While conservatism has dominated the conduct of its affairs, the city has always been progressive, and there has been no department which has shown better results than that of finance. As will be seen by a table elsewhere, showing the relative assets of seven cities, three of which have a larger and three a smaller population than Springfield, it has good reason for being proud of this department. The total valuation of property, not including personal, amounted to $5,180,210 in 1852; in 1900, the personal and real valuation aggre-



H. A. SLOCUM, City Engineer

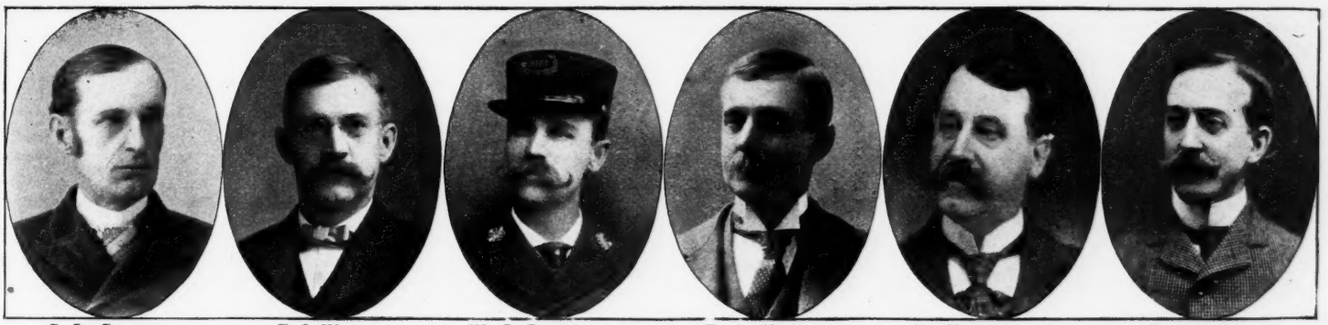
E. T. TIFFT, City Treasurer

W. F. GALE, City Forrester

D. S. MARSH, Park Commissioner

A. A. ADAMS, Supt. Streets and Sewers

JAS. KIMBALL, Health Agent



C. L. GOODHUE, Chief, Water Works | E. I. WHITE, Overseer of the Poor | W. J. LITTLEFIELD, Chief Fire Department | E. A. NEWELL, City Clerk | W. H. C. AUGUR, City Collector | E. J. MURPHY, Property Committee

gated $72,358,481. In addition to the realty and personal tax, every male citizen of twenty years of age or over, is obliged to pay a poll tax of $2 annually, without the payment of which he cannot vote.

The financial reputation and credit of this city are of the first rank. Last year, when Boston and New York failed to sell 3 per cent. bonds at par, Springfield disposed of a lot at a small premium. This places Springfield bonds in the same class with the leading cities of the country, whose size and prestige give them a much wider market.

As in most cities, the offices of the treasurer, auditor and collector are closely related. This has been more particularly true of this city since 1887, when the office of city treasurer was separated from that of city clerk with which it had been connected since 1852. In the former year, Mr. Eliphalet Trask Tifft, who had been serving the city in another capacity, was elected to fill the new office. In accordance with a pronounced custom of the city he has been annually re-elected without opposition. Mr. Tifft has been aggressively in earnest in promoting the financial standing of his city, and it is almost wholly due to his efforts that the financial reputation of the city is so well and favorably known among investors outside of the State. There is no New England city which has so small a tax rate and none with so small a per capita indebtedness.

The report of the City Treasurer, for the fiscal year ending December 10, 1900, showed that the total receipts from all sources during the year, excluding the temporary loan in anticipation of taxes, amounted to $1,946,593.80, or an increase of $372,280.86 over the preceding year. The total gross funded debt of the city, at that time, amounted to $2,727,100.

To provide for the payment of this funded indebtedness there is already deposited in the water works sinking fund the sum of $461,861.90, leaving a net indebtedness on account of water works of $1,038,138.10. The sinking funds for the several other debts amount to $233,787.25, leaving a net funded debt of $993,312.75, exclusive of the water debt. The funded debt was increased by certain public improvements during the fiscal year of 1900, and a certain amount was paid during the year, so that the net indebtedness, exclusive of the water debt, amounted to less than one and one-half per cent. of the average valuation, and $731,687.25 less than the debt limit.

There are a number of little devices about the office which would interest similar officials elsewhere. By means of a Yawman and Erbe card index the treasurer keeps tab on the city bonds. This tells him in the most efficient manner to whom, when and where to pay either principal or interest on city bonds. His bookkeeping has been expedited by the use of the loose leaf ledger system as made by William G. Johnston and Company, of Pittsburg, and the Baker-Vawter Company, of Holyoke, Mass.

The duties of the City Auditor, who died a few months since, have been performed by Mr. Tifft until his successor was chosen at the recent election. The Auditor is required to audit all bills and payrolls presented for payment, to make quarterly examinations of the accounts of the City Treasurer, Water Commissioners, City Collector and City Clerk. The accounts of the commissioners of the sinking fund are also compared with those of the treasurer.

The City Collector, Mr. William H. C. Augur, became attached to this office ten years ago, but was chosen to fill the vacancy caused by the death of the former collector early last year. In addition to collecting all regular taxes, the amount assessed to property owners for watering the streets is also paid to him. Mr. Augur, has a system of bookkeeping which is simple but efficient in its operation. He sends a printed notice with the amount of each taxpayer's tax filled in, together with other necessary information, such as office hours, date when interest will begin on all unpaid taxes, etc., to each taxpayer. Everything is thoroughly systematized, so that on rush days he can handle the largest crowds without delay.

PUBLIC SERVICE CORPORATIONS

Springfield pays $75 per arc lamp, of 1,200 candle power, per year, for nearly 800 lamps, at a total annual expense of over $61,000, and the city is required to furnish lamp poles. The company lighting the city also has an extensive commercial system. It pays nothing for the valuable privileges granted.

It is only quite recently that the city authorities have been able to secure legislation requiring all wires to be placed under ground within a radius of two miles of Court Square. It would be manifestly unwise and unfair to the operating electric light, telephone and telegraph companies to compel immediate compliance with this law, so it is planned that not less than three miles nor more than five miles of streets shall be cleared each year. The work has been under way two years, and will soon be completed.

There is an undisputed gain in the general appearance of the streets and in safeguarding the public. The city is fortunate in having

THE ART MUSEUM

used in the construction of the conduit system the products of the American Vitrified Conduit Company, of New York. But it is to be regretted that the city did not construct its own conduit system and rent its duct space to the several companies at a fair price. To grant the privilege to several companies which are obliged to use wires is open to serious objections.

Of all the public service companies which have been granted valuable franchises, the street railway and telephone companies are the only ones which have given anything in return, and the latter is hardly worth mentioning, it being only a discount of one-third to the city for the rent of its instruments. The least which is given by telephone companies for similar privileges in some Western towns is the free use of all the instruments the city requires.

Like most American cities Springfield has been unfortunate in its

ASPHALT PAVEMENT IN FRONT OF CITY HALL

dealings with the corporation which has received the most valuable franchise—the street railway company. It pays a corporation tax and what is miscalled an excise tax—in other States it is known as the franchise tax—amounting to 2¼ per cent of the gross receipts. This is all that the city realizes from the deal, except the commodious, cleanly and comfortable cars, and courteous treatment, which are exceptionally good as compared with most cities. But there are no commutation rates. It is a straight, five-cent fare. Moreover, the company does not pay one cent toward the construction and maintenance of the pavement between and for two feet on either side of the tracks, as is done in most cities outside of Massachusetts.

Now contrast this condition with the three separate street car companies operating lines within the city of Dayton, Ohio. All the companies pay a corporation tax, but not a tax on gross receipts. The service is as rapid, but not as cleanly as that of Springfield, although it is not obnoxiously untidy. All the companies are required to pave between their tracks and eighteen inches on either side, and keep the same in good repair. They also sprinkle and clean the tracks. This means the saving of many thousands of dollars to the city. Moreover, anyone can buy six tickets for a quarter, or twenty-five for a dollar, which practically gives a four-cent fare. In Dayton one hundred tickets would cost four dollars, while in Springfield they would cost five dollars, and a ticket gives the passenger all the privileges of a five-cent fare, including universal transfers. This is a nominal division of 20 per cent. of the gross receipts among the patrons of the road. Of course, everybody does not buy tickets, but it is safe to say that the Dayton roads pay more than 10 per cent. in this way on their gross receipts, whereas Springfield only pays 2¼ per cent.

Another fault to be found with the Springfield Street Railway Company is that the car fender used is worse than an apology. As a matter of fact, it is more dangerous than none. It is surprising that a city possessing so many admirable features should permit itself to be so imposed upon. An illustration of a correct fender is given on this page.

THE STREET DEPARTMENT

There are few cities in the United States that have as well organized, equipped and administered a street department as that of Springfield. This is largely due to its non-partisan operation and the fact that it is conducted by men who are selected because of their peculiar fitness for the positions, and, also, because it employs what is commonly known as the day labor system. Merit and not "pull" is the requisite recommendation for a position. The present incumbent, Mr. Arthur A. Adams, is a young man of the "strenuous life" type, and well adapted to the office. Since his college days, when he took the degree of C. E., he has had considerable experience in the same class of work performed in this department, and has been especially successful in handling men. His forceful manner in discharging his duties is sufficient evidence that no mistake was made in placing him at the head of this department. In this connection it would be only just to say that much credit for the present satisfactory condition of Springfield's streets is due to the faithful service for fourteen years of the predecessor of Mr. Adams, Mr. William L. Dickinson, whose work was commended in the warmest terms by the present incumbent.

The equipment of this department consists of road rollers, scrapers, sweeping machines, watering carts and every piece of apparatus which is found necessary in the construction and maintenance of streets. The authorities have adhered to the well known New England characteristic, and made their purchases on the principle that "cheap apparatus is dear at any price, and that the best was none too good for its use." The inventory of 1900 valued the complete outfit at $36,471. 04, which consists of carts for street cleaning, made by local firms; two sweepers for the same department, one made by the Brooklyn Railway Supply Co., Cos Cob, Conn, and one by the Abbott Downing Co., Concord, N. H.; six steam rollers of varying weights, made by the Buffalo Pitts Company, Buffalo, N. Y.; one Barnard and Castle road scraper, sold by William C. Oastler, New York; one road machine, made by American Road Machine Co., Charlestown, Mass.; push carts, used in the "white wing" division of the street cleaning force, made by D. J. Barry & Co., Charles Hvass, and the Chapman & O'Neil Manufacturing Company, all of New York; two two and one-half ton road rollers, made by the Ames Plow Company, Boston, Mass.; street watering carts, made by the Studebaker Brothers, South Bend, Ind.

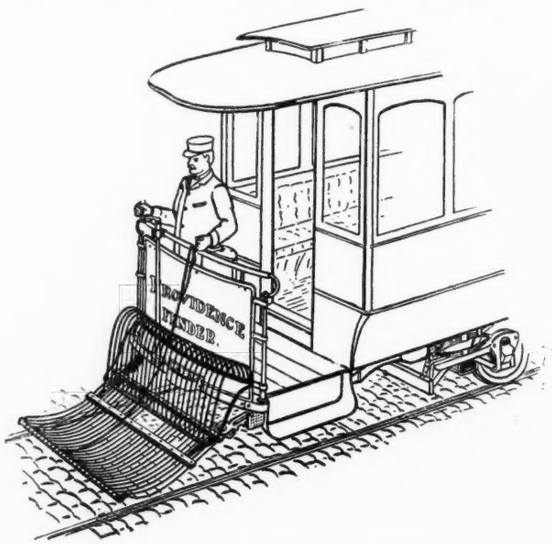
PUBLIC PARKS AND STREET PAVEMENTS

	Public Parks. (acres). Owned by City.		Granite and Belgian Blocks.	——Miles of Street Paved With—— Bricks.	Wooden Blocks.	Asphalt and Asphalt Blocks.	Macadam.	Total Miles Street Paved.	Miles Street Unpaved.	Miles of Sewers.	Miles of Street Railway Track.
Lawrence, Mass.	129.33		3.15				17.00	60.79	6.00	53.50	12.00
New Bedford, Mass.	227.00	15.79	3.74			.42	53.68	134.88		62.99	20.79
Des Moines, Ia.	468.20			60.50	.25		.25	61.00	450.00	67.04	41.37
Springfield, Mass.	484.61		2.34	2.69	.09	.44	34.25	97.33	40.00	94.42	39.32
Somerville, Mass.	52.10	4.69	5.90	.11			19.74	38.76	22.98	77.70	28.80
Troy, N. Y.	20.00	5.00	21.23	7.63	.16	4.50	4.00	72.52	25.00	33.04	28.00
Hoboken, N. J.	9.00		15.90			4.80	.10	20.80	10.00	14.00	10.35

In Troy there are 95 acres of other parks; in Lawrence, .75 of an acre, and in Somerville, .70 of an acre.

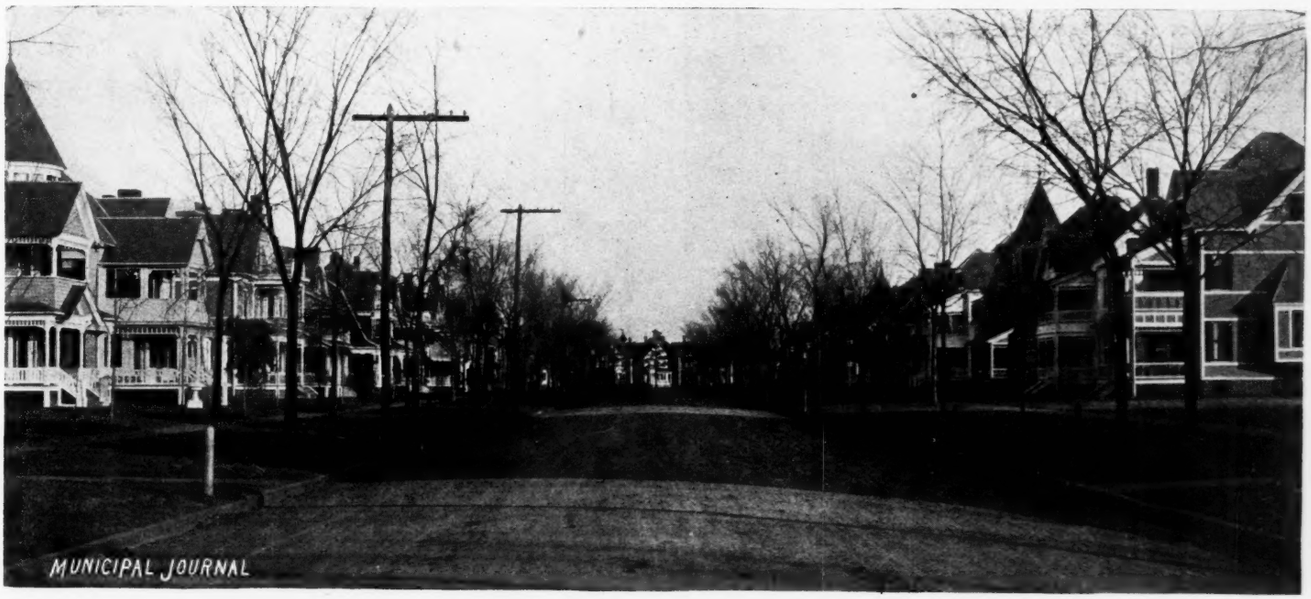
THE PERMANENT PAVEMENTS

The first permanent pavement was laid in Springfield in 1887.



THE RIGHT KIND OF A CAR FENDER

when 432 square yards of granite block were laid on a sand foundation, on Main street, which is the main business street of the town. Since then improvements have been rapidly made. At the close of 1901, the amount of pavements, in square yards, was as follows: Granite blocks, 47,988; vitrified brick, 66,044; rock asphalt, 5,758; Trinidad asphalt, 2,247; creo-resinate wood block, 2,780. All the granite block pavements have been laid on a sand foundation and most of the remainder upon a six-inch concrete base. All asphalt pavements have a ten-year guarantee and brick pavements, of which a few have been laid by contract on one year guarantee.



DARTMOUTH STREET, MACADAMIZED, 1901

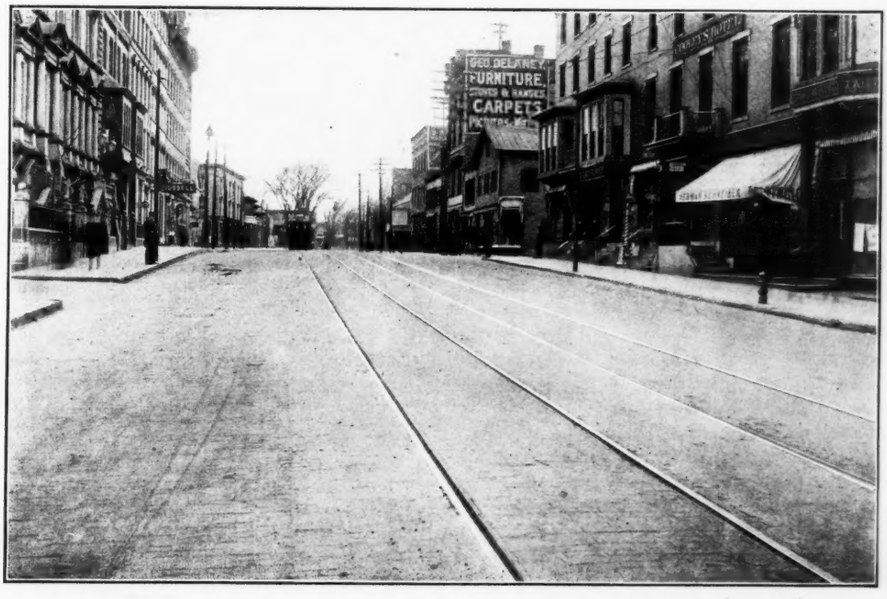
The only stretch of wood pavement which has been tried by the city was laid last fall under extremely trying conditions, and by a contractor who did not understand how the material should be handled. It was unevenly laid, and when the pitch dressing was applied it was cool weather, so that the pitch congealed in a thick layer on top, which made it slippery. This was the fault of the contractor rather than a defect in the pavement. Moreover, the spot chosen for such a pavement was most unfortunate, because of a heavy grade. This made it difficult for horses to travel on in rainy or snowy weather, but even this defect could be easily overcome by the application of a little sand. The specifications of Philadelphia, for the laying of asphalt pavement, call for the sprinkling of sand on the asphalt pavements when it is wet or snowy, and that on a dead level. On a grade, like this, it would be all the more necessary to sprinkle sand on a smooth pavement like asphalt or wood. It is the common practice of Boston's street department to sprinkle sand on all smooth pavements in wet or snowy weather. This custom prevails in Europe when the condition of the weather requires it. The creo-resinate grooved wood block should have been used instead of the smooth block, on this particular place in Springfield. But there is no doubt that the wood pavement will improve with use, even in this trying location. The city of Springfield has some of the finest macadamized streets to be found in the country, and every square yard has been laid and kept in repair by the department at a comparatively low cost. Below will be found an illustration of one of the streets which was macadamized last fall. Including the cost of preparing subgrade hauling and rolling rock and other materials, the Dartmouth street macadam road cost only 43 cents per square yard.

STREET CLEANING STATISTICS

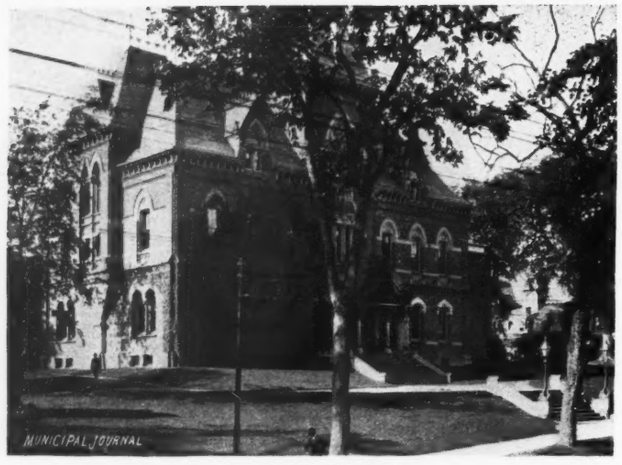
	Swept by hand or machine.	Swept per week, sq. yds., by city.	Persons employed by city.	Cost of maintenance.*
Lawrence, Mass.	Both	100,000	30	$19,256
New Bedford, Mass.	Both	145,000	25	11,994
Des Moines, Ia.	Both	† 598,805	† 28	14,549
Springfield, Mass.	Both	532,443	57	42,879
Somerville, Mass.	Both	300,000	32	18,325
Troy, N. Y.	Hand	725,000	260	77,194
Hoboken, N. J.	Both	792,000	40	12,354

* Including sprinkling.
†For seven months, no sweeping for five months.

There are several defects, however, in the organization of this otherwise most excellent department; but they are not due to the superintendent. They consist in the lack of certain authority. For



MAIN STREET, LAID WITH CREO-RESINATE WOOD BLOCKS IN SEPTEMBER, 1901



THE PUBLIC LIBRARY

instance, the gravest fault is that the regulation, or rather lack of regulation, which grants permission to every "Tom, Dick and Harry" to rip up the streets on almost any pretext, without first securing a permit from the superintendent of streets. Corporations, such as gas, electric light, street railway or private individuals, are permitted to dig into pavements without the slightest hindrance. No one, not even the water department which is owned by the city, should be allowed to disturb any pavement without a permit from

PUBLIC SCHOOLS

	No. buildings.	Total No. teachers.	Total avg. attendance, scholars.	Cost of maintenance.
Lawrence, Mass.	27	289	7,485	$171,253
New Bedford, Mass.	25	307	7,941	220,605
Des Moines, Ia.	48	438	11,333	263,407
Springfield, Mass.	34	355	14,583	333,242
Somerville, Mass.	24	287	9,368	282,148
Troy, N. Y.	20	219	5,126	146,387
Hoboken, N. J.	* 13	204	6,681	183,612

* Including one school in city hall, one in library, three buildings rented.

the head of the street department. Pavements suffer greater damage from this than from natural wear.

DEPARTMENT OF ENGINEERING

Usually this department is the chief one in construction and maintenance, in so far as such work has to do with streets, sewers and the like. It is the custom, however, in Massachusetts cities to make the City Engineer the consulting expert for the entire city. Therefore, when a new street is to be laid out, grades to be made, sewers to be constructed, the engineering is referred to the City Engineer. Mr. C. M. Slocum is at the head of this department, and makes his reports to the City Council. It cost $10,930.04 to maintain the Engineering Department for the year 1900. But the importance of the engineer's work is not to be measured by this small expenditure.

Just in the matter of testing of materials, the City Engineer can either make or break the construction appropriation for this municipality. The excellence of the general results obtained depends very largely upon the expert ability of this official. The methods employed by Mr. Slocum in administering the affairs of his department have been most satisfactory. In studying and testing cements he has found the American brands so superior, in price and quality, that he discontinued the use of imported Portland cement some years ago. Among the American brands, of the Rosendale, he has used the "Brooklyn Bridge" and "Hudson River"; of the Portland, the "Alpha," the "Atlas," and "Ironclad," with satisfactory results. As a rule he uses the Portland for concrete and the Rosendale for other forms of construction.

The sewer system of the city is one of which its citizens may be proud, in the planning and construction of which Mr. Slocum has been largely the instrument. The system is nearly one hundred miles in length, and includes brick and cement mortar, clay pipe, cement pipe and miscellaneous materials. Its total cost up to the close of the fiscal year of 1900 amounted to $1,125,691.98. Some of the conditions have presented engineering problems, which, while difficult, have been successfully solved by Mr. Slocum. It is to be regretted that there is not space enough at our command to illustrate and describe some of the more important achievements.

The one serious fault of the system is that it empties into the Connecticut river, thus contributing to its pollution. This presents a not insurmountable difficulty, for there are several well known methods of treating sewage, which, both from the standpoints of efficiency and cost of installation, are well within the means of the authorities of this city.

PROPERTY VALUATION AND TAX RATE

	Assessed Valuation of Property. Real.	Personal.	Tax Rate Per $1,000 State.	County.	City	Total.
Lawrence, Mass.	$30,498,975	$9,342,720	†	†	‡	15.60
New Bedford, Mass.	35,762,290	22,122,162	.35	1.60	14.45	17.60
Des Moines, Ia.	11,089,920	2,781,510	2.80	9.30	26.30	$42.40
Springfield, Mass.	55,676,320	16,682,161	.33	.72	12.75	13.80
Somerville, Mass.	47,430,000	5,148,200	.19	.60	14.41	16.00
Troy, N. Y.	43,806,291	5,341,259	1.81	4.20	13.70	19.71
Hoboken, N. J.	25,770,900	2,020,030	2.60	5.60	16.00	24.20

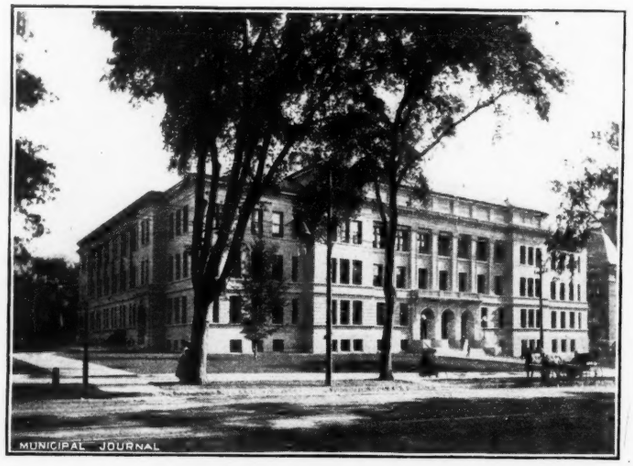
† Not reported. ‡ Not including school tax.

Legal basis of assessment, per cent. of full value on real and personal, is 100 in all cities. The basis in practice is the same, except in Des Moines, where it is 25 on real and personal, and in Hoboken, where it is 70 on real and 50 on personal

OTHER IMPORTANT DEPARTMENTS

The information bureau of Springfield, as in most cities, is found in the City Clerk's office. Mr. E. A. Newell, who has been its chief since its creation as a separate office in 1887, possesses the essential qualifications—ability to systematize and turn off a large amount of work—to insure the efficient handling of this part of the city's affairs. Besides being recording clerk for most of the important legislative and statistical matters, he is practically a whole election board in himself, keeping track of every voter in the city. Without the aid of the card index system he would be unable to perform this work with any degree of satisfaction to himself or to the city. The largest fire-proof vault space in the City Hall is placed at his disposal, but even this is small in comparison with the urgent needs. Some of the unprotected records in his possession are among those which could not be replaced at all if destroyed, and others only at a large expense. Of course, the disastrous fire has not yet visited the City Hall, but there is no assurance that it will not do so.

There was a time, and not so many years ago, when Springfield was infested with a small army—several thousands during a year—of tramps, which had to be cared for in some way at the city's expense. To meet this demand a "Wayfarer's Lodge," similar to that in operation in Boston, Washington, Syracuse and elsewhere, was created. Here, lodging and food were supplied for the price of a little labor, consisting almost wholly in the sawing and splitting of a few sticks of wood. This method of treating the question gradually reduced the number of tramps from thousands to a few hundreds, so that, last year, under the administration of former Mayor Hayes, the lodge was discontinued for an indefinite period. While the number of tramps has not materially increased, there is some talk of opening it again. The poor department in which the lodge is in-



THE HIGH SCHOOL BUILDING

cluded is under the supervision of Mr. E. I. White, who acts as its agent. The expense is comparatively slight. For the past year, out of a total appropriation of $39,000, $9,000 was devoted to outdoor relief. Most people in Springfield are happy in the possession of a home, or, at least, a comfortable place to live, maintained at their own expense, and the number obliged to appeal for assistance is small, when compared with cities of its size.

The City Property Committee is one of the most important committees of the City Council. It consists of five members, of which Mr. E. J. Murphy has acted as chairman during the past year. It is almost unique in its functions, for, in many cities, the work of this committee is performed by an expensive department. While this plan works satisfactorily in Springfield, it is more than probable that the organization of a department would be more effective for most cities.

Here, as in most other American cities, the rules and regulations for the erection and inspection of buildings are defective. On the other side of the Atlantic the most stringent measures are adopted to prevent fires, which are rigidly enforced, and it is almost impossible to erect a shoddy building; that is, one which is not fireproof. Here, however, even in the larger cities, as well as in Springfield, the practice is altogether too lax.

CARE OF THE PUBLIC HEALTH

All things considered, the public health of Springfield is more carefully guarded than in any other municipality of its class. It employs the usual methods for milk and food inspection, and the prevention and suppression of contagious diseases. Formaldehyde and sulphur are commonly used as disinfectants. The regulations governing the disposing of animals suffering from tuberculosis and from other contagious diseases are made by the State, and the enforcement of such regulations is in the hands of the State Cattle Commission, but the general oversight of this municipality is in the hands of the Board of Health. Mr. James Kimball has been at the head of this department for several years. He has several assistants and employs a force of men the year round. The collection of what is known as "wet garbage" comes immediately under his supervision. The manner of disposal of this garbage is one of the faults of the department. It is carted to the suburbs and plowed under waste land. This is said to be satisfactory to the citizens and the department, but it is not considered good practice among sanitarians. The city needs a destructor plant, which could be operated at but slight additional expense.

The collection of ashes and rubbish is performed by contract. The Health Department has practically nothing to do with this part of the work, it being under the special supervision of a committee of the City Council. This, also, is bad practice.

The city has recently constructed and equipped a modern isolation hospital for general diseases and a special one for smallpox cases. The administration and equipment of these hospitals are admirable in every way. They are much better than are found in some of the larger cities.

When Springfield obtains a new charter it would be wise to revise that poriton relating to this department. It should include only those functions which have to do with the inspection of food products of all kinds, including milk, meat, game, etc.; the inspection of plumbing, the prevention and suppression of contagious diseases, and it should have sufficient authority to act with the greatest rapidity in all cases of emergency. The collection of garbage, ashes and rubbish should be placed in the hands of the street cleaning department; it does not rightfully belong in this one.

DEBT AND SINKING FUND

	Debt. Bonded.	Debt. Floating.	Sinking fund.	Net debt.	Legal borrowing limit, per cent.
Lawrence, Mass.	$2,108,500	$77,883	$356,083	$1,830,300	† 2½
New Bedford, Mass..	3,819,000	200,000	843,989	3,175,011	† 2½
Des Moines, Ia.....	* 763,000	* 34,868	70,091	* 727,777	‡ 5
Springfield, Mass. ...	2,727,100	49,387	595,283	2,181,204	† 2½
Somerville, Mass.	1,478,000	350,000	.....	1,828,000	† 2½
Troy, N. Y.....	1,506,056	.....	25,087	1,480,969	‡ 10
Hoboken, N. J.....	1,424,000	2,000	133,887	1,292,113	||

* Not including school debt. † Average assessed valuation for three years. ‡ Assessed valuation. || Controlled by legislation.

THE CITY FORESTER'S GOOD WORK

The city has 40,000 street trees, which are under the care of the City Forester. If these trees were planted in a single row twenty feet apart they would make a row about eighty miles long. This number does not include those in the larger parks. Mr. William F. Gale is the City Forester, and is an enthusiastic champion of the city tree. He guards with jealous care his large family. As in most cities, the horses are among the worst enemies of the trees, or perhaps we should say their careless owners or drivers. Mr. Gale has secured the passage of an ordinance which imposes fines for the violation of the regulations of the department. He uses printer's ink freely. Immediately upon the creation of the department, some

MAIN STREET, LOOKING NORTH

three years ago, large placards with the following notice printed thereon were tacked up all about the city:

NOTICE.

It is Violating the Law
to Hitch Horses to TREES.
to Allow Horses to Deface TREES.
or to Mutilate TREES in any way;
also to Leave Horses Unhitched in the Street.

BE CAREFUL! Do Not Do It.
City Forester's Office, Springfield, Mass.

In addition to this the same notice was printed on small cards which were extensively distributed among horse owners. There were many violations of the law the first year, but during the fiscal year ending in 1901, there were only twelve arrests, convictions and fines for violation of this rule.

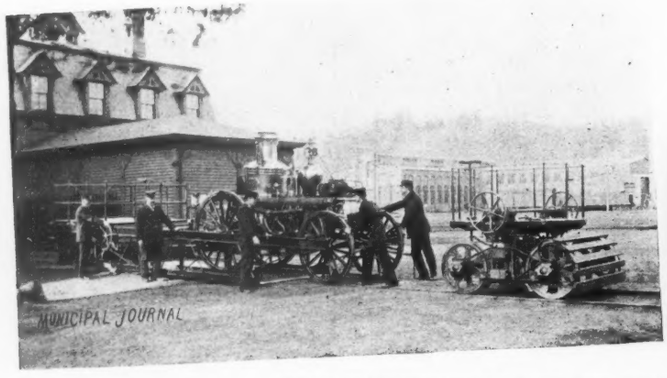
Mr. Gale has formed an organization among the school children which has been exceedingly helpful in the care of the trees. The society now has over 4,000 members. It is known as the Springfield Tree Protecting Society.

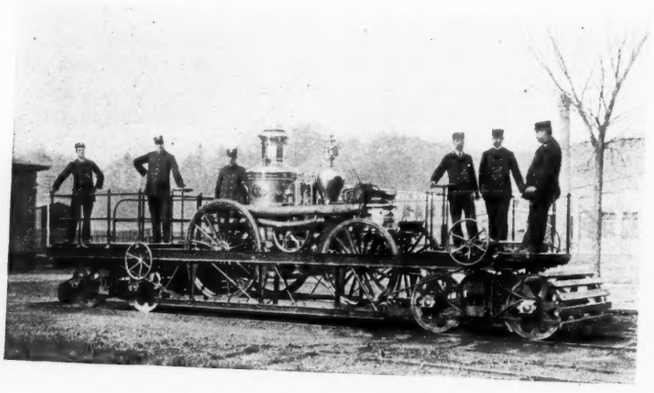
It only cost a little over $4,500 to run the department last year. When this is compared with the splendid results achieved, it may be considered a trifling expense. The many enemies which street trees have to contend with have been aggressively attacked by Mr. Gale, so that the insects, horses and other enemies have been successfully held in check, if not altogether vanquished. Trees which have been ill have been carefully nursed. Tree dentistry and surgery have been intelligently practiced. There is no department in the administration which has given more satisfactory results than that

of the City Forester. This city, in this respect, has set an example which it would be wise for other municipalities to follow.

POLICING THE CITY

The maintenance of law and order is not so difficult a task in this as in some other American cities. This is due to the general excellence of the New England character and the presence of a small foreign element. Nevertheless the police force, in its membership and equipment, upon a pro rata basis, is equal to that of the larger cities and is much better than most of the smaller ones. For instance, this force has one member to every thousand in population, whereas the city of Scranton, Pa., has a total force of fifty-three for a population of 110,000. The area of the two cities is about the same, but the latter has a large per cent. of unruly foreigners and should, of the two, have the larger force.





TROLLY TRANSPORTATION CAR FOR FIRE ENGINE—FOR USE IN SUBURBS AND NEARBY TOWNS

The moral tone of the Springfield police force, as might be expected, is of a high order, and above the average. The irregularities which obtain in cities like New York, Chicago, Philadelphia and many of the smaller ones, will not be tolerated by the citizens of this New England town. The personnel of the force from the chief down is above the average.

POLICE STATISTICS

	Policemen.	Licensed saloons. No.	Amount license.	Arrests for drunkenness.	Total arrests.	Cost of maintenance.
Lawrence, Mass.	58	57	$2,500	1,491	2,567	$59,195
New Bedford, Mass...	103	57	a	1,091	1,875	119,892
Des Moines, Ia.....	40	69	1,200	1,434	4,764	38,600
Springfield, Mass. ...	62	49	b	1,415	2,384	64,069
Somerville, Mass.	52	..	...	771	1,503	‡ 60,227
Troy, N. Y.....	103	244	500	605	2,135	91,124
Hoboken, N. J.....	93	320	250	964	2,350	108,146

a Innkeepers, $1,500; saloons, $1,000 to $1,400.
b Innkeepers, $1,800; others, $1,500.
‡ Including expense of police courts, jails, work houses, etc.

Mr. George M. Stebbins is the efficient head of the department. He was appointed about a year ago. He has introduced the permanent patrol system, which he thinks works to better advantage than the old. Another innovation has been the use of a colored light located directly over the signal patrol box, which can be lighted by touching a button at headquarters. By this means the patrolman on any beat can be called within a few minutes from headquarters. This has two advantages: first, it enables the officer in charge of headquarters to keep more thoroughly informed as to the fidelity of the patrolman; and, second, it makes it possible to send police assistance to any part of the city more quickly than it otherwise could be done. For example, some one might ask, by telephone, for police assistance two miles away from headquarters. The operator of the Gamewell Police Alarm Telegraph System could touch the button which would light the signal lamp over the patrol box, and so call the patrolman. Upon calling up headquarters over the telephone the patrolman would learn where his services were needed. Thus far the chief has only installed two of these lights, one of them being at the union railway station. Such excellent results have followed that he contemplates equipping the entire system. As will be seen from the foregoing statistics, the department of Springfield compares favorably with the group of seven cities about its own size.

There is connected with this department what is known as a Police Relief Association. It has a total membership of fifty-nine and was organized in 1893. Its purpose is to furnish sick and death benefits to members of the force. Its revenue is derived from the payment of certain dues by its beneficiaries. Up to date its total income from all sources has amounted to $9,635.70. There have been disbursed for sick benefits $1,191.50; for death benefits, $980. Cash on hand amounts to $7,367.80, which is deposited in local savings banks.

THE FIRE DEPARTMENT

The unique feature about the Springfield fire department is its fire engine truck. This piece of apparatus is to be used for transporting engines over trolley lines. Illustration elsewhere show how the engine is loaded and how it appears when ready for transportation. The idea was conceived by Fire Commissioner E. P. Chapin, partially invented by Chief Engineer Littlefield, and constructed by the Wason Manufacturing Company of Springfield. It is a piece of apparatus which should be in the possession of every department of the country where the trolley line is in extensive operation, either within the city limits, or where there is an interurban connection.

The utility of the truck is obvious. It furnishes quick transportation for fire engines to the outskirts of a city, and to suburban towns and villages that may be in need of assistance. With this specially built truck an engine can be loaded or unloaded with the greatest rapidity. It is an inexpensive way of taking care of the suburban fires and those which occur in the outskirts of a city. If it were not for this rapid means of transporting an engine company to the outskirts of this New England city its fire losses would be much larger, for its equipment, per square mile, is not up to the average. The total value of the city's department foots up to $305,755, including lots, buildings and equipment. The following statistics will show how it compares with a half dozen other cities nearest its size in population:

FIRE DEPARTMENT STATISTICS

	No. of regulars.	Alarms.	Fires.	Poperty loss.	Cost of maintenance.
Lawrence, Mass.	34	174	163	$16,500	$53,969
New Bedford, Mass.....	44	181	181	18,782	78,645
Des Moines, Ia.....	69	374	355	100,861	62,920
Springfield, Mass.	56	222	127	62,158	99,598
Somerville, Mass.	30	228	216	61,011	60,959
Troy, N. Y.....	49	212	202	150,000	51,643
Hoboken, N. J.....	59	219	199	† 143,905	76,236

† Does not include loss at docks of North German Lloyd S. S. Co., June 30, 1900.

As might be expected the fire alarm telegraph in use is that made by the Gamewell Fire Alarm Telegraph Company, of New York, which includes a receiver, a transmitter and the storage battery system. The latter was installed and applied by Mr. Decrow, the Boston agent of this company, and the rest of the service by the New York office some years ago. It is needless to say that it has given satisfaction, for the name "Gamewell" is a synonym for efficiency.

Chief Littlefield, who has been at the head of the department for many years, is one of the well known chiefs of New England. His record is among the best in his profession. The water used

by the department is supplied by the city, which has a high gravity pressure of 120 pounds, upon which there are 600 hydrants. The low pressure system of sixty pounds has 335 hydrants.

THE WATER DEPARTMENT

The only public service industry owned by the city is the water works plant. Its affairs are managed by a board of three water commis ioners, of which C. L. Goodhue is the chairman. Mr. Goodhue

FIRE HEADQUARTERS ENGINE HOUSE

is a man of large experience and to him, perhaps, more than to any other person or group of persons, is due the credit for the excellent results which have been obtained. The city acquired the water works plant from a private corporation in 1872.

Its source of supply is from two large impounding reservoirs located in the hills several miles away, which are fed by streams, springs and surface water. One is high and the other a low pressure service, the former giving a pressure of 120 pounds to the square inch and the latter sixty pounds. The aggregate supply amounts to 2,295,792,000 gallons. The supply is distributed entirely by gravitation.

The miles of pipe, including the large mains leading from the storage reservoirs, aggregate over 144 miles. This pipe has been supplied, at different periods along through the years of construction, by M. J. Drummond & Co., of New York; Charles Millar & Son, Utica, N. Y.; U. S. C. I. Pipe & Foundry Co., Philadelphia, Pa.; R. D. Wood & Co., Philadelphia, Pa.; Warren Foundry & Machine Co., New York, N. Y.

All the valves and fire hydrants were supplied by the Chapman Valve Manufacturing Company, Springfield, Mass.

The galvanized iron pipe fittings and service pipes were supplied by the Crane Company, New York; the J. H. Cunningham Company, and Sumner & Goodwin, both of Boston.

The Globe special castings were installed by the Builders' Iron Foundry, Providence, R. I.

The Walworth Manufacturing Company, Boston, put in most of the brass work and fittings.

The valve boxes were made by R. D. Wood & Co., Philadelphia.

The service stop boxes were supplied by Bingham & Taylor, Buffalo.

Only two kinds of water meters have been used; those of the National Meter Company, New York, and of the Hersey Manufacturing Company, of South Boston, Mass.

The water rates, as compared with those of other cities, are rather higher. For instance, Buffalo's minimum rate is $4 per family, where one tap is used in the kitchen, while Springfield charges $8. The minimum rate of most cities owning their own water plants is not over six dollars, and most of these cities are put to the additional expense of pumping their supply. The consumer in Springfield should get his water for a minimum rate of six dollars, inasmuch as it is a gravity system of distribution. And the charge for water by meter measurement is larger than in most other cities. It seems, to an unbiased observer, as though there should be lower charges to the consumer.

PUBLIC PARKS AND INSTITUTIONS

THE High School building of Springfield is, without question, the most conspicuous edifice in Western Massachusetts. It is happily located with picturesque surroundings, and with ample ground space. Its proportions and details are based on the Italian Renaissance, but the structure has an individuality of its own. In arrangements, appointments and all other particulars it is a gem, which is well set in the general public school system of this model city.

In the group of seven cities, used for comparison, Springfield has, as will be seen by reference to one of the tables elsewhere, the largest amount of space devoted to park areas. There is a chance to improve some of the small parks, but it must be confessed that in Forest Park —the largest area devoted to this purpose—the city has one of the most beautiful natural parks in the country. The craze for improving park areas has generally spoiled most parks in American cities, from the start, but here nature has been carefully guarded from the attacks of the destroyer. Fortunately, those who had in their hands the shaping of the park policy were wiser in their day and generation than their contemporaries in most other cities of the United States. At the beginning it was wisely decided that Forest Park should remain a natural park, with only limited concessions to the civilization effects, such as roads, walks, pavilions, seats and so forth. But even in the roads and walks an effort has been made to prevent the finished effect, found in the modern improved street or macadamized roadway.

Taken as a whole the city is open to congratulation upon the possession of so beautiful a park system, but before further improvements are planned an expert landscape architect, like Mr. Warren H. Manning or Mr. John C. Olmsted, should be employed to carefully study the situation, and determine the mode of treatment for the next ten years. Such a course would be likely to produce the most desirable results.

In the description of this New England city, which is so typical of this portion of the East, only those features which would be most helpful to the largest number of cities have been noticed. For this reason there are many of the public buildings and institutions, such as the art museum, library and so forth, to which only a reference can be made. When the city is viewed as a whole, even though it has some defects, it comes the nearest to being a model city of any of its size in the United States, and, with the possible exception of Washington, D. C., the best governed city without regard to size. When a new charter is framed, provision made for purifying the water supply, a refuse destructor and sewage disposal plants installed, and when a few other improvements, previously mentioned, are effected, then, indeed, Springfield may be called one of the model cities of the United States.

A VIEW IN FOREST PARK

OPEN SPECIFICATIONS FOR ASPHALT PAVEMENTS

Protest Against Shutting Out Asphalt Rock—Inferior Material Does Not Lower Cost—Naming Private Products Expensive Favoritism—Hedging About Trusts Dangerous Move for City Engineers—Public Sentiment Demands Best Work, and Open, Fair Competition

By M. D. Coffeen*

PERSISTENT and aggressive efforts have been made in recent years all over the country to hoodwink the public by erroneous statements regarding asphalt pavements, by misrepresentations as to the facts about the industry and by the suppression of knowledge of other available materials. These efforts have been measurably successful, to the extent of shutting out competition of contractors capable of furnishing the superior pavements of natural asphalt rock with attending great saving in cost to the municipalities. This has been accomplished by using words in specifications that effectually give the control to the asphalt trust of all such work. The writer is induced, by these considerations, to discuss the essential points that ought to be included in contracts for asphalt pavements.

In many cities, and wherever the trust has had enough power, the specifications are drawn with the percentage of purity so low and the quality of pavement so inferior that the resulting pavement is not properly to be classed as an asphalt pavement at all; yet, by naming specifically "Lake Pitch" as the material that can be used, the contracts are controlled absolutely in the trust's interests and contractors for asphalt rock not permitted to bid.

Whose interests are served by such closed and partial contracts? For whose advantage are such unbusinesslike proceedings carried on? Certainly not those of municipalities. The public is not served by shutting out or discriminating against competition in quality and price. All the soft, sophistical sentences so well learned and glibly used to excuse such methods will not endure for a moment in the presence of an enlightened public sentiment.

Suppose the tables were turned and that engineers were to put in their specifications the words, "Said pavement is to be constructed of Asphalt Rock from the Tolu deposit in the State of Kentucky"; could any contractors bid on such specifications except with the consent of the Federal Asphalt Company, the owner of this property? Does any one imagine for an instant that there would be any *real* competition, even with a dozen bidders? It might be alleged that in such case the material would be pure and excellent and durable (which cannot always be truthfully affirmed of that which is often named by engineers), and that the patriotism of utilizing a home material, instead of a foreign, is commendable; yet these circumstances would not justify, or palliate, such flagrant discrimination in public affairs. It is to be hoped that no such advantage will be sought by any enthusiasts of asphalt rock, for it would be rightfully condemned by public sentiment.

In the spirit of fairness in business and freedom in contention, the following are offered as essential points to be incorporated in all specifications for pavements, whereby the purpose is to secure, at a reasonable cost, a pavement entitled to be called "Asphalt," with all the excellencies that name implies:

THE FOUNDATION

The foundation generally adopted is of concrete, from five to seven inches thick, according to the traffic and subsoil. The composition will be entirely satisfactory where a good grade of cement is used, and, if "Natural," it should be one part cement, two parts sand, and five parts broken stone; and if "Portland," one part cement, three parts sand and six parts broken stone. The usual requirements regarding mixing and laying need no mention.

THE BINDER COURSE

Bituminous concrete binder, as it is called, is a necessity, where the wearing surface is an artificial pitch mixture, for this is the only expedient known to prevent the wearing surface, which is unavoidably softer on the lower than on the upper side, from sliding or "creeping" on the base, thus making the surface in ridges or waves.

This binder course adds nothing to the wearing quality of the surface nor to the strength of the foundation. It should be composed solely of small, broken stone and pure asphalt; for, if petroleum oils are used in the binder course, it disintegrates and destroys the wearing surface resting upon it and thereby injures the pavement.

The binder course is usually one and one-half inches thick. It should be compacted while hot and so composed that it will be neither too brittle in winter nor too soft in summer.

ARTIFICIAL MIXTURE WEARING SURFACE

The sand should be fine and clean. Not to exceed 5 per cent. of powdered limestone may be permitted, to assist in giving hardness to the mixture. The limestone tends to make the surface glossy and slippery and that is the reason that in Europe, as much sand as possible is always utilized with the natural asphalt rock which contains limestone. The pitch asphalt should be pure and of a proper combination of strength and vicosity so that the surface will be firm to sustain traffic in the hotest weather and will not break or crumble in winter or crack and check when unused.

The purity of the pitch asphalt should be 95 per cent., or more, and of suitable consistency; then none of these things occur, and wherever cracks, or breaks, or softness, occurs in a pavement, it is proof positive that the asphalt contained clay, or organic matter, or was fluxed with petroleum oil, instead of liquid asphalt.

Mr. Emil Kuichling, in the July number of the MUNICIPAL JOURNAL AND ENGINEER, stated that in Europe the natural asphalt rocks, which contain even the small amount of clay mentioned, are avoided in making pavements. Then how absurd to expect excellent pavements to be made with pitch, which is nearly or quite one-half impurities, such as is frequently permitted by the closed style of specifications!

NATURAL ASPHALT ROCK WEARING SURFACE

This should be laid directly upon the concrete base. As it is equally firm or solid throughout it has no soft under-side to slip, or creep, and needs no binder to keep it from becoming uneven, or wavy, the surface being always true. The sand constituting the rock should be fine and, of course, entirely free from limestone or other impurities; hence, the surface has a grip to the horses' shoes, or feet, and is not slippery when damp, being similar to sanded rubber. (See Byrne on Highway Construction.) The contained asphalt, being naturally absolutely pure, must be of the correct quality and consistency to give the rock the requisite firmness and still retain a plastic quality to prevent breaking.

WEARING SURFACE REQUIREMENTS AND GUARANTEES

Whether of natural asphalt rock or artificial mixture, the material should be put on the street and spread when hot, at a temperature of about 200 to 225 degrees F., and compacted before it cools; first, with hand-rollers; and, second, after sprinkling a little cement to color the top, rolled continuously with a ten-ton roller until it is cooled.

When finished the wearing surface should be two inches thick. Some cities require a half-inch more and some a half-inch less. Two inches of a really good asphalt pavement, as herein suggested, will be sufficiently thick to sustain any traffic and will last more than a generation, being practically indestructible.

No asphalt containing an appreciable quantity, say, 1/10 of 1 per cent. of clay, or other impurity, should be allowed in any pavement, and neither coal nor gas tar, nor petroleum, nor their products (as they are positively detrimental), should enter, in any way, into the construction.

A ten-year maintenance guarantee for such a pavement should add nothing to the cost beyond the fee charged by the surety company.

* President of the Federal Asphalt Company, Chicago.

GENERAL REMARKS

The writer apprehends that the foregoing requirements will be objected to by the pitch asphalt interests, but submits to the candid judgment of everyone if they will not produce a better pavement, more enduring and which will cost less for maintenance and repairs than the kind so often contracted for.

True, these specifications admit asphalt rock, but only in competition with really meritorious qualities, and in such case the admission can only result advantageously.

Recently an engineer in a small city justified the insertion of the words "asphalt from pitch lake" in his specifications, by a statement, to the effect that, in his opinion, it was "very doubtful if asphalt rock would make a good pavement." Such a man should be careful or the public may not give him credit for being stupid but might esteem him venal.

Are not the pavements of London, Paris, Berlin and other European cities, for a half a century, and those of Los Angeles, San Francisco, Columbus, Louisville and other cities of this country where they have been in use for a score of years, sufficient to establish the fact of the excellence of asphalt rock pavements?

It is also well known that the inventor and patentee of the artificial pitch mixture himself claimed only to have invented a "substitute" for natural asphalt rock that would cost less than that of the genuine which had to be imported.

Quite a change has occurred, when in the latter days the "Genuine" is to be excluded in terms, notwithstanding that by reason of recent discoveries it may be cheaper than the substitute.

The time has passed when any city engineer, or other public officer, in this country can afford, as he values his office and his reputation, to place limitations on public works for the sole benefit of special interests and discriminate against natural asphalt rock pavements, when it has the unequalled indorsement of every scientist and expert in Europe and of a galaxy of American celebrities, including Austin C. Byrne, C. E., whose most excellent work on "Highway Construction" has reached its fourth edition and is accepted as authoritative; also Major J. W. Howard, for many years in charge of the Engineering Department of the Barber Asphalt Company, as an authority on asphalt; also George W. Tillson, C. E., President of Brooklyn Engineers Club, M. A. S. of M. I., M. A. S. of C. E., and Assistant Engineer of Highways of Brooklyn, and author of an exhaustive treatise on "Street Pavements and Paving Materials," and also Frank V. E. Bardol, Chief Engineer of Buffalo, who has in charge more asphalt pavements than any other man in the world.

The writer does not pose as being indifferent in the rivalry between natural asphalt rock and artificial asphalt mixture, but he has endeavored to maintain fairness and appreciates that it may not be wise for American cities, at the present time, to entirely eliminate artificial mixtures from competition as is not done in Europe. Excellent pavements have been thus made and can be still so made if specifications will require the highest grade and qualities of materials.

When requirements, such as herein recommended, are insisted upon and faithfully carried out, whether the pavement be natural asphalt rock or artificial mixture, city officials can confidently rely upon having a quality, excellence and an economical construction not obtainable under the less stringent requirements and closed specifications heretofore much too frequently adopted.

CHICAGO'S PROPOSED STREET RAILWAY FRANCHISE

Municipal Ownership a Possibility of the Future—Municipal Control an Immediate Necessity—Improvement of Terminal Conditions—Betterment of Service First to Be Considered—Fares and Compensation

THE street railway and franchise question has been uppermost in the minds of Chicago citizens for many months. The corporations have been active in their endeavor to obtain all possible concessions and the friends of the city have been equally anxious that its rights should be adequately protected and that no privilege should be granted without a fair return. A commission and several committees have been at work upon the problem for a long time and most of them have issued reports upon the various phases of the question, all of which have been published and commented upon in previous numbers of the MUNICIPAL JOURNAL AND ENGINEER. The special committee on local transportation issued its report under date of December 11, 1901, together with a proposed outline of street railway franchise renewal ordinance, submitted for the consideration of the City Council.

As the question is one of general interest and as the MUNICIPAL JOURNAL AND ENGINEER is constantly receiving requests for information along this line, the outline is given in full. While the provisions of this ordinance have particular reference to the solution of the Chicago problem, yet they will be helpful in settling similar questions in other municipalities.

The committee does not recommend immediate municipal ownership, but does insist upon municipal control. The report is not complete, as the help of experts, in the legal and engineering fields, is needed to continue the investigation as to routes, terminals, motive power and subways.

OUTLINE OF RENEWAL FRANCHISE ORDINANCE

I. UNIFICATION—JOINT USE OF TRACKS AND POWER—TRANSFERS.—In any negotiations that may be had the desirability, from the operating point of view, of complete unification of management, should be urged. Within the area bounded by Chicago avenue on the north, Halsted street on the west and Sixteenth street on the south the companies receiving grants shall agree to use tracks and motive power jointly, when ordered so to do by the City Council, to such extent and in such manner as the City Council may direct. Each company receiving a grant shall obligate itself to arrange and rearrange its tracks within such area in such manner as the City Council may from time to time direct. Each company must carry a passenger from any point on the lines of street railway owned, leased or operated by it to any other point on its lines for a single fare. Each company receiving a grant must agree to enter into transfer arrangements with other companies for the interchange of transfers so as to enable a passenger to ride from any point in the city to any other point in the city for a single fare. Provision shall be made by the City Council to prevent abuse of transfer privileges.

II. SERVICE—CONTROL—DURATION OF GRANT.—It should be a condition of every grant that the company receiving the same shall proceed at once to put its road bed, plant, and equipment in first-class modern condition, and it shall maintain the same in first-class modern condition and shall render first-class service for the full term of the grant. The company shall be subject to all general ordinances of the City of Chicago relating to street railways now in force or hereafter to be passed. All work of construction, reconstruction and repair shall be subject to the supervision and approval of the Commissioner of Public Works. All electrical work shall be subject to the supervision and approval of the City Electrician.

All rails hereafter laid in streets paved with asphalt, granite, brick or wooden blocks shall be modern improved rails of the type known as the grooved rail, as described in an ordinance of the City Council passed June 11, 1900, and published on page 498 of the printed Council Proceedings for the year 1900-1901, or a modified type of same to be determined by the City Council. And wherever a street occupied by rails of a different type than that hereinbefore described shall be newly paved or repaved with any material aforesaid then the company shall replace its rails on such street, or so much thereof as may be newly paved or repaved as aforesaid, with modern improved rails of the grooved type, as above described.

All tracks not used or not required by public interests shall be removed from the street by the company at its own expense on the order of the City Council, and the street shall be left by said company

in as good condition as it was in prior to the removal of such tracks.

All cars must be of the best and most approved style, finish and design. All cars must have center aisles and must be without running foot boards along the sides. All cars must be equipped with electric push buttons that shall be within the reach of all passengers. All closed cars must be vestibuled. All cars must bear appropriate and conspicuous signs, so placed as to indicate to observers from all sides of the car the route and destination. All cars must carry at night illuminated signs indicating the route and destination. All cars must be properly heated, lighted and ventilated. All cars must be equipped with the best and most approved style of brakes and fender devices. The company must take such reasonable precautions to prevent injury from electrolysis as the City Council may from time to time direct. Adequate night service shall be provided, as may from time to time be ordered by the City Council. The company shall at all times operate on all its lines a sufficient number of cars properly to accommodate passengers. All cars shall be operated singly unless otherwise expressly authorized by the City Council.

The enumeration herein of special requirements or the mention of specific regulations shall not be held to imply the relinquishment by the City Council of the right to make other requirements or regulations which but for such enumeration or mention it would have the right to make. And the City Council shall specifically reserve the right to regulate such street railways. Such right of regulation shall include the right to regulate the running of cars and the headway, the right to regulate the laying down of tracks for street railways, the transportation of passengers thereon and the kind of rail to be used, the right to pass and enforce ordinances to protect the public from danger or inconvenience in the management or operation of such railways, and the right to make and enforce all such regulations as may be needful to the securing of adequate and sufficient accommodation for passengers and to insure their comfort and convenience.

The grant will be for a period of twenty years. The City Council shall have the right, at any time during the second ten years of the grant, to terminate the same, upon not less than six months' notice, and to take over the property of the grantee suitable to and used by it for street railway purposes, upon paying therefor the full value of the property for street railway purposes (which value shall be taken to be the cost of duplication less depreciation), with 5 per cent. additional thereon as compensation for the compulsory sale, but there shall be no allowance for franchise values of other consideration whatsoever. In case of failure to arrive at a decision of the matter by mutual agreement, the value of the property so to be taken over shall be determined by three competent persons, one to be chosen in such manner as the City Council shall direct, one to be chosen by the company, and the third to be chosen by the two thus selected. In case of failure of the two persons chosen as aforesaid to agree upon the third person within a reasonable time, then, upon the petition of either party in interest, and after notice to the other party in interest, said third person shall be named by the Appellate Court. If the City Council, at any time during the second ten years of the grant, shall be of opinion that the grantee is not using the grant to the best interest of the public, and if at such time the said City of Chicago shall not have received from the Legislature the grant of authority and power necessary to enable it to take over said property and utilize it, then the City Council may terminate the grant as aforesaid, and may authorize any other corporation designated by it for such purpose to take over such property upon paying therefor its full value as aforesaid, with 5 per cent. additional thereon, as above provided, such value in case of difference to be determined by three competent persons, one to be chosen by the buying and one by the selling company, and the third to be chosen by the two thus selected. In case of failure of the two persons chosen as aforesaid to agree upon the third person within a reasonable time, then, upon the petition of either party in interest, said third person shall be named by the Appellate Court. At the expiration of the grant the grantee may be required to sell to the city or to any corporation designated for such purpose by the City Council all of its property suitable to and used by it for street railway purposes, upon the payment of its full value, as above provided, to be determined as above provided, but without the above allowance of 5 per cent. additional. At the expiration of the grant, if the company shall desire and shall be denied a renewal, the city shall take over at its value as above provided, to be determined as above provided, but without the said above allowance of 5 per cent. additional, the property of the company suitable to and used by it for street railway purposes, or shall make provision for its taking over by some other company designated by the City Council for such purpose.

III. All Grants of a Company to Expire or Be Terminable at the Same Time and in Like Manner.—Every company accepting a grant must agree that all its licenses, franchises, or grants of permission and authority, from whatever source derived, to lay down, maintain and operate street railways in the City of Chicago, shall expire or be terminable at the same time and in like manner as may be provided in such grant for the expiration or termination of the licenses or permission and authority by such grant given. In case a grant is made to any company overlying subordinate or leasing companies, the provisions of this section must be consented to, not only by the overlying company, but also by all of the constituent or underlying companies.

IV. Transfers, Sales, Leases, Consolidations.—No company accepting a grant as herein contemplated shall directly or indirectly sell or transfer its grant, or consolidate with another company, or enter into leasing or operating agreements with another company, except with the approval of the City Council. For any violation of this section the grant shall be subject to forfeiture.

V. Construction of New Lines as Needed.—Whenever in the judgment of the City Council the public interests require the extension of any line of street railway or the construction of any new railway line, the company when directed by the City Council to construct such new line shall construct the same and operate said line as a part of its system.

VI. Motive Power.—The cable form of motive power shall be abandoned. All cars shall be propelled by electricity, or such other motive power as may be authorized by the City Council. Within a district bounded by North avenue on the north, Ashland avenue on the west and Twenty-second street on the south no poles or overhead wires shall be used, and on all lines of railway where the cable is now in use the underground trolley system shall be substituted for the cable system throughout.

VII. Subways.—If the city shall construct or cause to be constructed within an area not larger than the area bounded by Chicago avenue on the north, Halsted street on the west and Sixteenth street on the south, subways or tunnels for the accommodation of street cars, the companies operating cars in such area shall, on the order of the City Council, operate in such subways or tunnels such proportion of their cars as such Council order shall direct, and shall pay for the use of such subways or tunnels a reasonable rental.

VIII. Special Services May Be Required.—If it shall be found practicable to have streets occupied by car tracks swept by car sweepers or sprinkled for their entire width by car sprinklers or to have street sweepings, garbage or other refuse removed by street cars at night, every company accepting a grant may be required by the City Council to procure the necessary equipment and to render for the city any of the services aforementioned. A company required by the City Council to render any such service shall receive therefor a reasonable compensation.

IX. City to Have Right to Use Trolley Poles.—The city shall have the right free of charge to place lights on all trolley poles that it may care to utilize for such purpose. The city shall also have the right free of charge to string city wires on such poles, but the stringing of such wires shall not interfere with the use of such poles by the company. All trolley poles shall be of iron or steel and shall be of neat and artistic appearance, and shall be equal in style, quality and appearance of the poles maintained by the city for electric light purposes.

X. Paving Requirement—Street Cleaning and Sprinkling—Removal of Snow.—The company shall fill, grade, pave and keep in repair, and sweep, sprinkle and keep clean sixteen feet of the way and eight feet where there is a single track. The company at its own expense shall also keep the said portion of all streets occupied by its tracks free of snow and ice. In removing snow and ice the company shall not be permitted to deposit same upon the portion of the street outside of such eight or sixteen feet, except temporarily with the consent of the Commissioner of Public Works. The City Council

shall be the judge as to when a street needs repairing, and the company shall repair the portion of the street which by this grant it is required to repair whenever it may be ordered so to do by the City Council, and in the manner ordered. And whenever the rest of the street not embraced in said eight or sixteen feet of width shall be newly paved or repaved then the company, as to said eight or sixteen feet, shall at the same time repave same with the same material and in like manner as the portion of the street outside of said eight or sixteen feet may be paved or repaved, or in such manner as the City Council shall direct.

XI. Policemen and Firemen to Ride Free.—City policemen and firemen in uniform and city detectives bearing cards signed by the General Superintendent of Police shall be permitted to ride free.

XII. Publicity.—The company shall make detailed annual reports to the City Council, in accordance with forms to be prescribed by the City Comptroller, giving full information on all such matters as may be from time to time specified by the City Council. For the purpose of verifying such reports the books of the company shall at all times during business hours be subject to examination by the City Comptroller or by some person duly authorized by the Comptroller to make such examination.

XIII. Tunnel Lowering.—The companies using the Van Buren street, the La Salle street and the Washington street tunnels shall, at their own expense, lower the same to such depth as the present or future interests of navigation may require. The companies using said tunnels shall also keep the same in good condition and repair.

XIV. Rate of Fare and Compensation.—The rate of fare shall not exceed five cents, with universal transfers, but tickets shall be sold at the rate of six for twenty-five cents and twelve for fifty cents. As compensation for the grant the company shall pay into the city treasury monthly a percentage of its gross receipts.

XV. Indemnity Clause.—The company shall save the city harmless from all suits, etc., growing out of the grant.

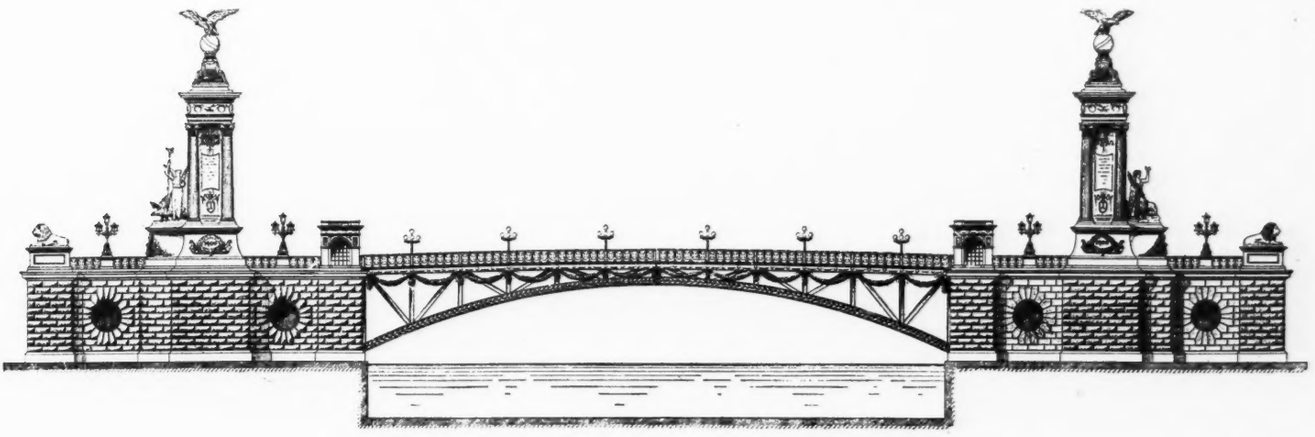
XVI. Penalty Clause.—There shall be a provision for a fine or other penalty to be visited on the company for failure to comply in good faith with all the requirements of the ordinance. And for persistent failure to comply with the requirements of the ordinance the grant shall be subject to forfeiture.

THREE NEW BRIDGES FOR WASHINGTON

The Old Swing Bridge Is Out of Date, Dangerous, Ugly, and an Obstruction to Navigation—The Bascule Bridge Is Replacing the Old Style in Leading Cities, Is Efficient and Capable of Artistic Treatment

By Walter J. Somers, C. E.

Every city in the United States is more or less interested in the bridge question, but New York, Chicago, Philadelphia, Boston, Washington and others with navigable rivers to be spanned are particularly concerned. Just at the present juncture attention is centered on the National Capital, because three bridge propositions are under consideration. All the plans for these three bridges have been under consideration for many months, but for various reasons, none of them has yet matured. The present Congress will, in all probability, dispose of the matter at this session and there are vital reasons why the modern type of bridge should be selected.



A BOULEVARD ROLLING LIFT BRIDGE FROM THE ARTISTIC STANDPOINT—CLOSED

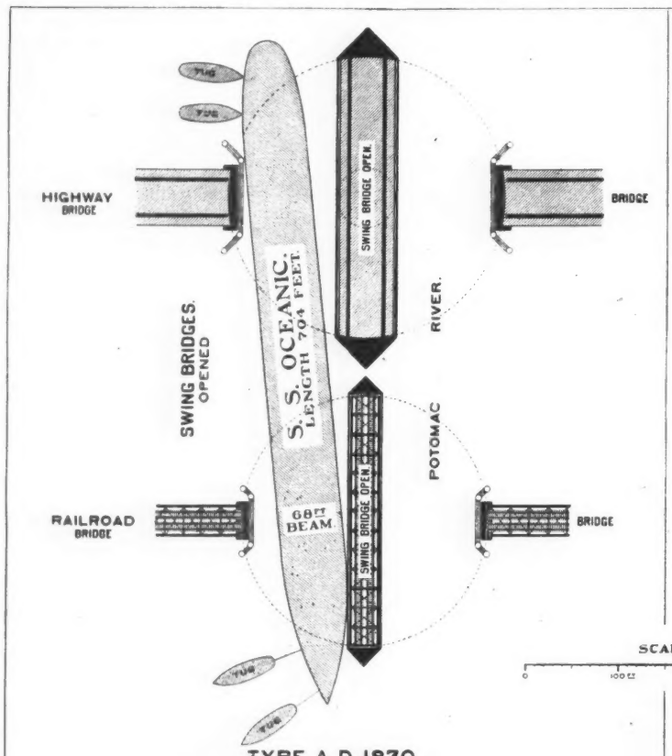
THE OLD SWING BRIDGE AN OBSTRUCTION

In many respects the Potomac is one of the most important rivers of the United States. It is the only means of water communication with the Capital and it is a most valuable means for the defense of the city. At a large expenditure by the National Government the river has been greatly improved so that it is now navigable for large ocean vessels as far as the Aqueduct Bridge, which is a fixed structure above Georgtown. The only artificial obstruction below the Aqueduct Bridge now existing is the historic "Long Bridge," so closely interwoven with the stirring events of the Civil War. This bridge is soon to be replaced by two new bridges; one to carry the two tracks of the Pennsylvania Railroad Company, and a second, adjacent to it, for highway and electric car traffic which will form the connecting link between Washington and Mount Vernon.

About a year ago the plans and specifications for a third bridge, to be known as the "Memorial Bridge," to reach from Washington to Arlington Cemetery, were approved by the War Department. Those in authority determined to do away with the old fashioned and defective swing bridge type and so provided for the use of the bascule or vertically moving bridge, which does away with the centre pier obstruction, to span the navigable or dredged channel of the Potomac. The funds for the building of this Memorial Bridge were not appropriated by Congress, but the sum of $568,000 was provided for the construction of the highway bridge which was to take the place of the old "Long Bridge." Adjacent to this the railroad bridge, which is to be built and paid for by the Pennsylvania Railroad Company, is to be constructed, and, it would appear, that the plans and

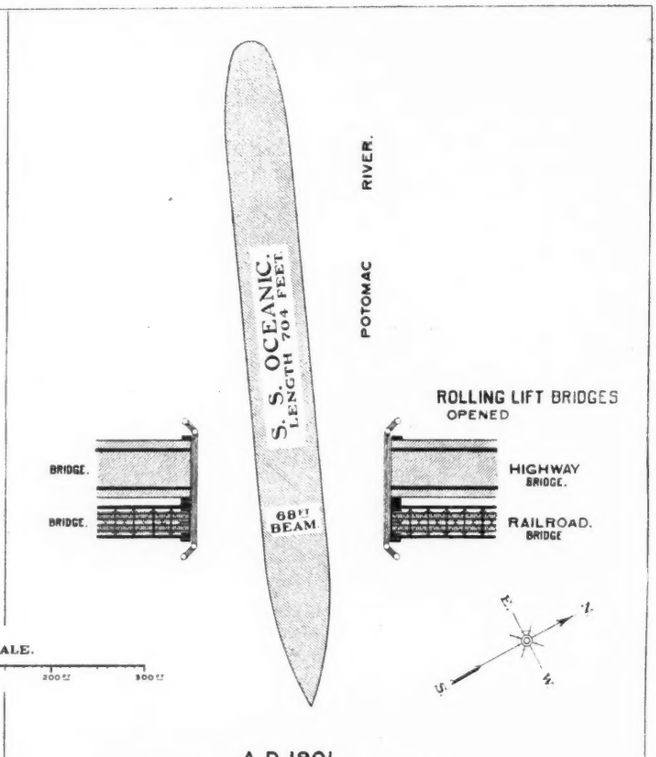
specifications of the latter call for the construction of the old style swing bridge which is not only out of date, but inefficient, and is sure to form a serious obstruction in the navigable part of the river.

The principal objections to the old style swing bridge are clearly set forth in Figs. 1 and 2. In the first place, in order to construct two bridges whose middle span over the navigable channel shall be of the swinging type and so permit the passage of vessels, they must



TYPE A. D. 1830.
ANCIENT MOVABLE BRIDGES.
PLAT SHOWING VERY OBSTRUCTIVE CHARACTER OF TWO ADJACENT SWING BRIDGES ACROSS THE POTOMAC RIVER AT WASHINGTON, D. C.

FIG. 1

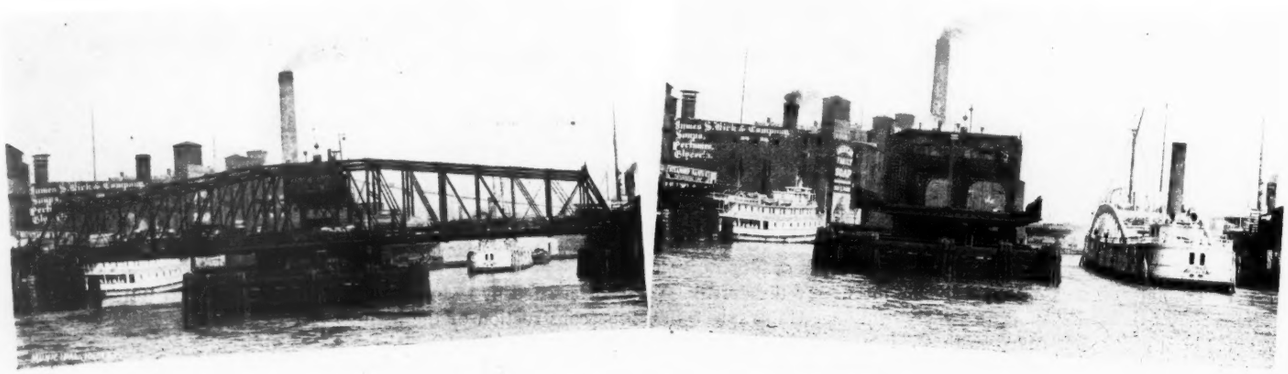


A. D. 1901.
MODERN MOVABLE BRIDGES.
PLAT SHOWING CLEAR UNOBSTRUCTED CHANNEL PROVIDED BY TWO ADJACENT SCHERZER ROLLING LIFT BRIDGES ACROSS THE POTOMAC RIVER AT WASHINGTON, D. C.

FIG. 2

needs be far enough apart so that the two swinging spans, when opened, shall not touch, as shown in the illustration. This, in itself, is a serious objection for various reasons. The principal objection, however, is that the centre pier, which is an absolute necessity to that form of bridge construction, forms an obstruction in the very centre of the channel which has been made at such a large outlay of

It is inconceivable why so progressive a corporation as the Pennsylvania Railroad Company should select the ancient type of bridge when the other is so clearly, from several standpoints, the better of the two. It is exceedingly fortunate for the Federal authorities as well as for the inhabitants of Washington, that, under the Act of Congress, approved February 12, 1901, the plans of both these



OLD STYLE SWING BRIDGE—ORSTRUCTS CENTER OF CHANNEL

bridges require the approval of the Secretary of War. The site of the proposed bridges and the curved nature of the channel of the Potomac at this point makes the construction of the old style bridge particularly inimical to local and national interests. In fact, in a tidal river like the Potomac, such an obstruction is much more serious than a similar obstruction upon the non-tidal rivers about the Great Lakes, where such obstructions have been universally condemned and are rapidly being removed, the bascule bridge being substituted. The War Department has already approved the plans and specifications which call for the construction of the bascule feature in the Memorial Bridge, and there are more vital reasons why it should adopt the same form of construction for the two bridges which are to be built further down the stream.

PRESENT PRACTICE FAVORS THE BASCULE BRIDGE

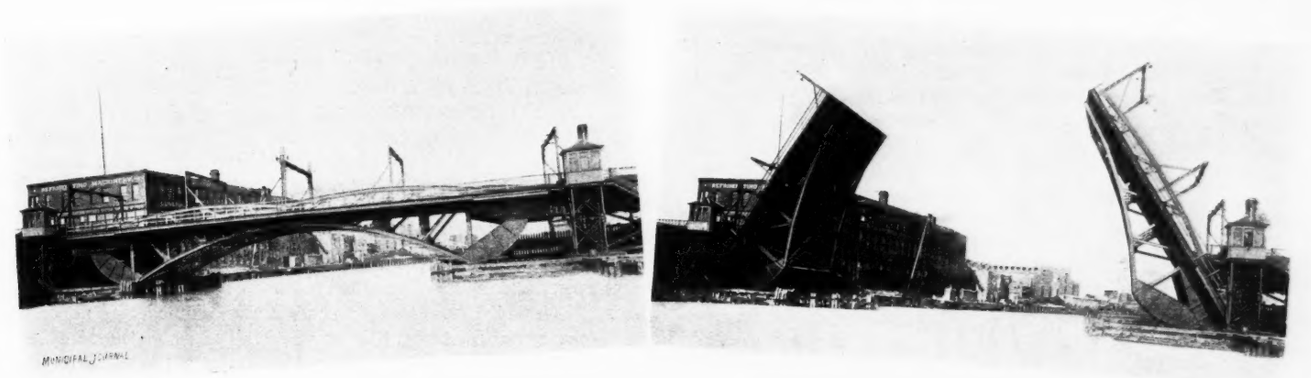
The recent practice of many American cities and all the great cities of the world favors the adoption of the modern type. In New York, Boston, Philadelphia, Bridgeport, Conn., Chicago, Milwaukee, Cleveland, Buffalo and many others, the swing bridges are being removed because they form obstructions to navigation. They are being replaced by vertically moving bridges. Just from the practical standpoint this is the only thing which is to be done and so long as it remains with the Secretary of War to approve or disapprove of the plans for the two lower bridges, it would seem reasonably safe to predict that the more modern type of bridge should be demanded from the railroad company, in conformity with the other two which the Government will construct. This would seem to be the only course to be pursued, because the rivers of the world are becoming of greater importance and value every day, as they form the connecting links by which vessels can reach the business, manufacturing, commercial and industrial centres located in the interior of the various countries. These rivers must and necessarily will increase in importance and value with the growth of population. More and more they will become indispensable to every nation as internal connecting public highways. It is, therefore, essential, not only that these rivers be improved, but that no artificial obstructions be placed in them which will impair, hamper or destroy their usefulness. This is true even though at the present time the existing commerce may not be large, as no one can predict what the demands for the early future will be, in view of the vast increase in our commerce during the past twelve months.

When unobstructed, the capacity of a river for the transportation of commerce and for service in times of war is stupendous. A river of moderate width and depth of channel can economically and safely carry more tonnage than a ten or twenty track railroad. In most civilized countries the principle is recognized that a navigable river is an extremely valuable public trust property and any impairment, alienation, misuse or misappropriation of the same is a serious violation of a public trust, even more serious and far reaching in its effects than a misuse of public trust funds. This principle is reasonable and just, and will be recognized by most citizens. The United States are singularly favored by nature with great rivers, which have played an important part in the formation of history, especially in times of war.

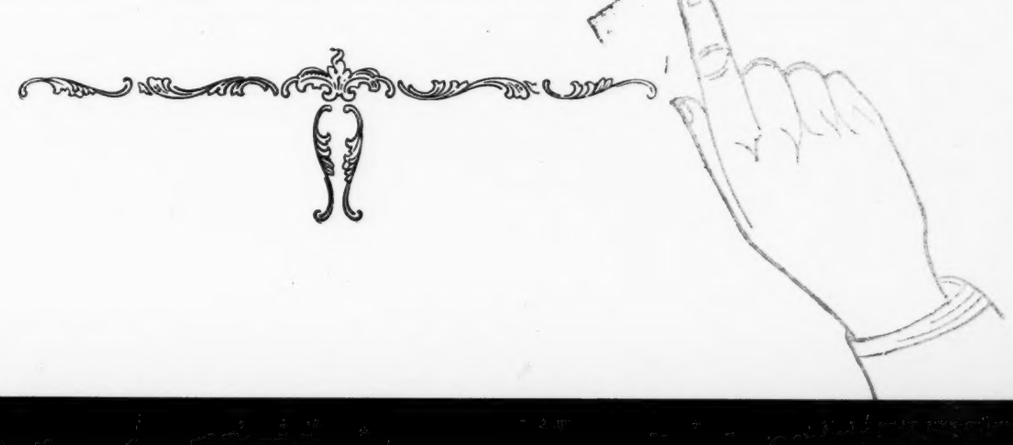
ORNAMENTAL AS WELL AS USEFUL

While it is not an essential from the standpoint of usefulness, nevertheless the possible artistic treatment of the bascule or Scherzer roller lift bridge is many points ahead of the old style swing bridge. As a matter of fact, the latter is beyond the reclamation of the municipal art enthusiast, and would ever remain an ugly blot upon the municipal river front. Whereas it will require only a glance at one of the accompanying illustrations to show the possibilities of combining the artistic with the useful. What is the use in making anything unattractive, when a beautiful effect can be secured by the use of a little forethought, common sense and brains, with no, or almost no, extra outlay? The cities of the Old World are giving these matters far more consideration than are we on this side of the Atlantic. And yet it is pleasing to note the remarkable improvement in public sentiment in this particular during the last decade.

But after all, it is the usefulness of the Scherzer roller lift bridge which appeals most strongly to public favor. For many years the old style swing bridge has obstructed the waterways which wind in and out through the city of Chicago. These are being rapidly replaced by the improved bridge. In order to show the advantages of the new, two photographs of both old and new are reproduced, one showing the bridge open and the other closed. "The wayfaring man, though a fool," could not err in selecting the modern bridge as the better of the two, the contrast between them is too great to permit of any other choice. These illustrations really force an answer to the question, whether anything can be more unwise and wasteful than to dredge a navigable channel in the Potomac river, at great cost, and then begin to formulate plans to obstruct the centre and best part of the dredged channel by installing the antiquated swing bridge with its central piers and protections. Such a procedure would not only be a violation of public trust but a waste of public funds.



HOW THE MODERN ROLLER LIFT BRIDGE CLEARS THE CHANNEL



ONTARIO METHODS OF BUILDING GOOD ROADS

Appropriations Once Wasted Now Used to Advantage—Andrew Pattullo, M.P.P., Leader of the Movement—Associations of Great Assistance—Road Machinery Indispensable—Millions Expended—Liberal Government Appropriations

By A. W. Campbell *

THE road question is one which is being very generally considered throughout Canada. Good Roads Associations have been formed in almost every province, those most active being in the Provinces of Ontario, Quebec, New Brunswick and British Columbia, while in every Province more or less consideration has been given to the subject by the Provincial Governments. Ontario, however, is the leading Province in this movement, both as regards an active public interest which has been organized in Good Roads Associations, and in Governmental action.

The roads of the Province were the chief public work, as with many of the Eastern States, until the time of railway construction, when Governmental aid, previously directed to the common highways, was largely withdrawn and applied to steam railway construction. The period of railway construction having reached its stage of comparative completeness during the past couple of decades, the public has awakened to the fact that the common highways have been deplorably neglected, and that the system of constructing and maintaining them, in which statute labor is the chief factor, while exceedingly useful in pioneer days, has become utterly unfit for the changed conditions of to-day.

All this applies to older Ontario, which, however, is but a small proportion of the greater Ontario, including what is now known as New Ontario. Older Ontario lies within that peninsula which is indicated by Georgian Bay, Lake Huron, Lake Erie, Lake Ontario, and the St. Lawrence and Ottawa Rivers. New Ontario adds to this the great extent of territory extending north to Hudson Bay and bounded on the east by the Province of Quebec and on the west by the Province of Manitoba. The settled portion of the Province comprises 24,000,000 acres, which contains a population of 2,500,000. The land still available for settlement has an extent of more than 140,000,000 acres, the resources of which are those of mine, forest, fishery and agriculture. From these resources the Provincial revenue is very largely derived, and direct taxation for Provincial purposes is almost unknown.

THE BEGINNING OF THE MOVEMENT

For many years it has been the policy of the Government to open up, as required, in the newer districts of the Province what is known as colonization roads, the appropriation for this work having amounted to about $150,000 annually.

It is, however, in the older section of Ontario that the movement for good roads has had its modern significance. The first definite step was taken in the year 1894, when the Good Roads Association of Ontario was organized, a large number of delegates attending this first convention, representing county councils, township councils, farmers' institutes, dairymen's and other associations. The plans and purposes adopted by the association and embodied in the constitution were the following:

1. To combine as far as practicable the efforts of all persons engaged in the work of road reform.
2. To awaken interest in the subject among people at large.
3. To receive, publish and discuss any well-considered plans for local, provincial or national action or legislation.
4. To aid in providing for a proper road exhibit and instruction in road-making at all farmers' institutes, county dairymen, creamery and other association meetings.
5. To establish the association on the broadest possible basis throughout the country, so that its influence may be of weight in any direction in which it may ultimately be thrown.
6. To obtain and spread among the local associations full information regarding recent legislation for road improvement.
7. To obtain and publish full information regarding methods of road building as practised in various parts of Canada, the United States, and other countries.
8. To procure and furnish the local association, at reduced prices, all valuable publications on the subject of roads and road legislation.

THE RAPID GROWTH OF PUBLIC SENTIMENT

Two years later, in 1896, the Government of the Province, recognizing the importance of the work of the association, appointed a Provincial Commissioner of Highways, whose duty, as defined, was to give the people of Ontario practical information on the best methods of road construction. This was, and still is, done by issuing bulletins and reports, by addressing public meetings and conventions, and by taking advantage of such opportunities as occur to contribute to various journals and the press generally. The chief duty of the commissioner, however, has been to visit municipalities desiring his services, examining the roads and materials available for their construction, discussing the question with the council, and usually addressing a public meeting. Under his supervision short sections of road are built as models, all his services in these matters being without expense to the municipalities. The office of Highway Commissioner, to which the writer of this article was appointed, has now been merged into that of Deputy Minister of Public Works.

ORIGIN OF THE FIRST ASSOCIATIONS

Of the first Ontario Good Roads Association, Mr. Andrew Pattullo, a prominent member of the Legislature and originator of the good roads agitation in Canada, is president; and one of the leading authorities of the Province on municipal questions, Mr. K. W. McKay, is secretary. A local association has been formed for the eastern part of the Province, which has been very active and is achieving excellent results. Its chief work has been the organization of a good roads train after the model of those which have been operated throughout the United States, but which, in this particular instance, has confined its work to a small section of Ontario, about ten counties, in each of which model sections of highway have been constructed.

Older Ontario is largely agricultural in character, being in this respect exceptionally fertile and prosperous. The farm holdings are not large as compared with the ranches of the West, nor are they small. Three hundred acre farms are not uncommon. Farms of two hundred acres are frequently met with, and one hundred acre farms are the rule. The result of this is that numerous towns have sprung up, more or less manufacturing, but largely dependent upon the agriculture of the surrounding country for support. The effect is to impose certain conditions upon road construction. Roads approaching railway and market towns are, in many cases, heavily traveled by vehicles loaded with farm produce, and receive the traffic from a considerable area. Beyond these are other roads of moderate travel, receiving the traffic from a smaller district; and beyond these again are the roads which accommodate but a few farms. As a result, every class of road is required, varying from the carefully designed macadam roadway to those which are merely the best that can be made out of a common dirt road. The intermediate class is the one which merits and receives the greatest consideration in Ontario, owing to the fact that its extent is much the greatest of any of these classes. It is the class of road in which the average Ontario farmer is chiefly interested, as it is the road which passes his own door.

MILLIONS EXPENDED FOR ROAD IMPROVEMENT

It is from this standpoint that the question of road reform in Ontario has been approached. The general agitation has been to secure the best class of road of an ordinary type for common farm traffic. In pursuance of this, the benefits of good roads have been urged. It has been pointed out that good roads from a business standpoint will improve the condition of all classes of farms, whether dairying, stock raising, or purely agricultural. The amount of the present expenditure has been pointed out. This, in older Ontario,

* Highway Commissioner of the Province of Ontario, Canada.

has amounted annually to about a million and a half days' of statute labor, and $2,000,000; or a total estimated value of $3,500,000. It has been shown to the farming citizens that this expenditure, applied on the statute labor basis, has been largely mis-spent and wasted. Those having immediate charge of the expenditure, termed pathmasters, are chosen annually by the township councils to oversee the work. Knowing nothing of scientific road-making, and annually giving place to their inexperienced successors, the work performed under this system has been one of patchwork and inefficiency, the work of one year frequently having to be undone the next.

A rapid revolution in these matters has not been attempted. The common highway is the chief public work in charge of the township councils. The Canadian farmer, who is the township councillor, the pathmaster and the voter, is conservative and clings to established custom with a tenacity that is unsafe and difficult to disturb. Slowly, however, by a process of education, the objects of the movement are being achieved, and without urging the expenditure of larger amounts upon the highways the farmer is changing his methods. The townships are steadily, of their own accord, giving up statute labor, providing instead a complete cash tax, and placing the control of the roads in the hands of permanently appointed overseers. Seeing the good results achieved, a willingness is created to vote larger sums of money yearly.

While Ontario is markedly an agricultural country, it possesses what is not always common in farming districts—a good supply of roadmaking material, distributed with a fair degree of uniformity. In some instances rock exposures occur, in places there are large beds of gravel underlying the surface mold, while other districts avail themselves of a considerable quantity of scattered boulders, which have to be removed from the fields.

MONEY SAVED BY USING LOCAL MATERIALS

Wherever consistent with fair wearing qualities, the materials available in the locality is to be recommended, as the importation of stone from a distance for use on country highways is not commonly looked upon with favor by councils as yet, and the use of the local supply, therefore, facilitates more general improvement. In the case of gravel the chief points observed are that it is clean; that is, free from excess of sand or earthy material, and that it is of fairly uniform size. These conditions can sometimes be secured by careful selection in the gravel pit, but in other cases screening is necessary to remove earthy material and large stones. In many instances where large stones prevail, a stone crusher, with screen attachment, is placed in the pit, and all material is passed through, thereby cleaning it and reducing it to suitable dimensions. Where field boulders are utilized, these, having been collected from the fields, are piled on the roadsides, where they are crushed by a portable stone crusher and left ready for use. In other instances, however, where there is not a local supply, crushed stone is brought in by train, the railway companies having shown a disposition to aid the improvement of roads, especially where they converge to their own stations, by giving reduced freight rates, amounting, in cases, to the bare cost of handling the stone or gravel.

ROAD MACHINERY AN INVALUABLE ASSISTANT

Machinery is used wherever possible in forming the ordinary type of country road. In constructing an entirely new road, a grading machine is the principal instrument employed in doing the earth work. Road allowances are commonly 66 feet in width. Except where heavy cuts or fills interfere, a graded roadway twenty-four feet wide is first laid out. A grading machine is used to crown and shape this to the contour of the finished roadway, and a heavy roller is then used to compact this thoroughly. In preparation for receiving metalling, the grader is then passed along the top of the roadway, cutting off the top and turning the earth to right and left, leaving it in loose shoulders with a space from eight to sixteen feet in width between. In this space the metal is placed, in thickness usually a foot, the roller compacting it as spread in layers. The earth shoulders are, as the work progresses, leveled with the surface of the metalling and are thoroughly compacted. On roads of exceptional travel, a quantity of metal, to any depth desired, is spread the entire width of the grade, twenty-four feet, to accommodate vehicles when turning out.

The crown given to this type of roadway is greater than is usually prescribed for a macadam roadway, as they are constructed to accommodate a line of traffic in the centre, the amount of crown for new roads being about one inch to the foot from side to centre. Open drains at the edges of the twenty-four foot grade convey surface water to the nearest outlets, and under-drains, usually placed below the open drains, are laid wherever their need is indicated.

Another type of the road in the Province is one which was first constructed a number of years ago by the Province, by a county council, or by a toll-road company. In these a good foundation has generally been established, having received applications of gravel or stone without number. It is not considered profitable to destroy this foundation to remove inequalities of grade, except when these inequalities are very pronounced, or the amount of traffic is very great. They are kept in a condition for travel by cutting off the square shoulders of earth and sod which form at the edges of the roadway. A grading machine, frequently drawn by a traction engine, is used for this work. The chief point to be noticed in this instance is that this sod and earth, formed for the most part from washings from the metalled roadway, is turned outward and thrown across the open drain, or otherwise removed. The crown of the road is completed with an application of new material which is rolled wherever the municipality owns or can rent a road roller.

THE INTRODUCTION OF CONCRETE CULVERTS

A feature developed in the course of the agitation for road improvement, is the construction of durable culverts of stone and concrete. Under the prevailing practice, these culverts or "sluices," were made of timber, a material so perishable that a considerable portion of the annual expenditure available was absorbed for renewals and repairs. For small openings up to two or even three feet in diameter, concrete pipe are found most serviceable, and when protected with a covering of earth and road metal do not interrupt the surface of the road as do the old type of wooden box drains.

Concrete culvert pipe is very popular from the fact that they can be made by ordinary labor in any suitable gravel pit belonging to the municipal council. The mold for making these tile is inexpensive, consisting of two spring steel cylinders, one of smaller diameter than the other. When placed on a plank platform, one centrally inside the other, there is a space between varying in width from two to four inches according to the diameter of the tile to be made. Into this space the concrete is rammed with implements adapted to the purpose. The most suitable gravel for this work is clean, fine, with a considerable proportion of sand; Portland cement being mixed in the proportion of one of cement to three of gravel. For culverts approaching a span of three or more feet, concrete arches are most useful. In making concrete arches, the usual methods of mixing and laying concrete are followed, a timber centre and framework being first constructed, within which the concrete is placed. In the larger culverts the cost is much reduced by incorporating stones of large size in the abutment, forming a rubble concrete. Up to spans of thirty and forty feet concrete arches are found, owing to their durability, much preferable to other materials; while the permanence of concrete tile effects a very considerable economy.

THE LEGISLATURE APPROPRIATES A MILLION

The latest development of the good roads movement in Ontario has been the appropriation of one million dollars by the Legislature to aid in the improvement of country roads. The motive for this step has, very largely, been to encourage county councils to assume the management of the most heavily traveled roads in each county, thereby forming them into one class, in the construction and maintenance of which the most efficient superintendence, plans, methods, and machinery can be employed. One third of the cost of constructing or reconstructing all roads assumed under a county system will be paid by the Provincial Government, and the act is so framed as to give county councils every opportunity to accept this aid. Should any counties fail in this, a proper proportion will be given to townships fulfilling certain prescribed conditions. A sufficient period has not yet elapsed to permit an estimate of the extent to which the act will perform its mission, but at the present time county councils are everywhere interesting themselves in the matter.

STREET SIGNS AND FIXTURES

Some of the Difficulties to Overcome—The Fundamental Requirements—The Choice of Location—Must Be Visible from Street Car and Sidewalk

PART I

By Nelson S. Spencer *

ANY discussion of proper street signs and fixtures is really a discussion of two subjects, with both of which the public is greatly concerned, but only over one of which has it complete control. It is a municipal function to designate the names of the city streets—it may be, but is not yet, a general function to regulate private advertising. It is clear that the questions involved in the regulation of private advertising are much more intricate than those with which the public is concerned over its own signs and fixtures, and yet the latter are far from simple. The former are primarily legal and only secondarily administrative; the contrary is true of the latter. But it is not my purpose now to discuss the regulation of private advertising, partly because it is a subject by itself and partly because it behooves a municipality to put its own house in order, at least as soon as it undertakes to criticise the doings of its citizens.

The increasing complexities of modern life render an apparent final adjustment of any problem unstable. It seems a simple matter to designate plainly the name of each city street. It was comparatively so when the name could be written on the house corner or on the corner gas lamp, and thus serve every purpose. Then the principal person to be informed was the pedestrian who was a stranger to the locality. But now, in a large city, the conditions are quite different. The persons to be informed are not only strangers to the locality, but passengers in a swiftly-moving trolley car, who know quite well the street they are traversing, but who wish to know the street they are approaching or passing. Strangers to the locality usually understand that the sign runs parallel with the street, but the passengers' demand is that it should run across the street, so that it may be read in transit. The gas lamp has largely disappeared, and has been replaced by an electric lamp, which does not lend itself readily to signs, being among other things, usually too high.

SOME OF THE DIFFICULTIES TO OVERCOME

The sign must be capable of being read equally well by day and by night. This is not certain of a sign on a house corner; it is not always visible at night and is rarely legible from any passing car. Moreover, a sign cannot always be readily affixed to the house corner at a proper height, or it may be one of many private signs on the house, and not easily distinguishable.

Further, the right of the proper authorities either to compel the owner of the corner building to affix a sign at his own expense, or to allow it to be affixed at the city's expense, has been questioned. This complication is peculiar to the United States, as such a right could not be questioned in other countries, where the powers of the government are not limited so strictly by a written constitution. There are, too, many corner lots not yet built upon, and a ready-made opportunity for street designation is lacking.

There is at present a moderate demand, which has been satisfied in some instances, that the nearest house number of the designated street should also appear upon the sign; another that the sign should indicate both the principal and the cross street. And, what is highly important, there is a growing demand that whatever method designation be used, it shall be, to say the least, not offensive to the eye, and, if possible, an artistic addition to the city.

There is a further matter to be taken into consideration. A modern municipality maintains or permits a number of public structures in the streets. It has posts for lighting either by gas or electricity, fire-alarm boxes, hydrants, police telegraph or telephone boxes, postoffice letter boxes, and often other structures. Any one of them, taken by itself, is not a great incumbrance, but, multiplied as they are, the obstruction to the street becomes serious. If possible, the addition of another structure, which is merely a sign-post, is to be avoided.

All these matters are conditions which ought to receive proper consideration and recognition in any scheme to satisfy the situation.

These conditions are not met in any city. In most foreign cities and in many of the United States, the streets are marked by plain signs—often blue enamel signs—affixed to the house corners, with some additional signs for special places. In the city of New York the signs were formerly usually placed on the corner street lamps. But at the present time there is almost an entire absence of any guide whatever to the lost and inquiring mind. There is no reasonable doubt that in time the conditions will be satisfactorily met, as the public demand becomes more and more insistent. But the result will be a slow growth, the outcome of various experiments.

THE FUNDAMENTAL REQUIREMENTS

In trying these experiments, there are certain points which should be considered fundamental and kept constantly in mind. Briefly stated, they are:

1. The signs should be easily legible by day and by night, and should serve two classes of persons—the stranger and the passenger in any vehicle of transportation in the street.

2. There should be no rigid rule of designation for the entire city, although the signs should be uniform as far as feasible.

3. The signs should be pleasing and, if possible, an artistic addition to the city streets.

4. Street structures should be combined as far as possible, and, if possible, reduced to one.

With these points in mind, the Municipal Art Society of New York has recently approached the problem. In New York City there has been in the past no defined authority in any official to order the proper designation of the streets, and no law or ordinance touching the subject. Authority has been assumed from time to time by the officia having charge of the streets, but no duty has been laid upon him which he could be compelled to observe.

Under the revised charter, which goes into effect on the first of January, 1902, the borough president in each borough is charged with the duty "of the placing of all signs indicating the names of streets and other public places." But when the Municipal Art Society sought to effect some substantial result it found that the first thing to be procured was the enactment of an ordinance by the Municipal Assembly by means of which responsibility could be definitely placed on some official. But before suggesting to the Municipal Assembly, as it did, a form of

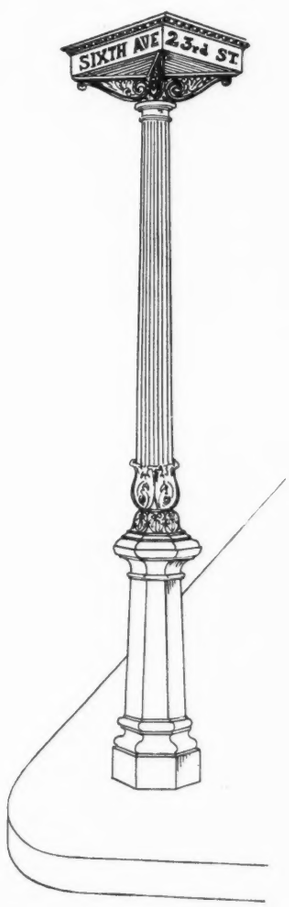
NOTE.—From the current issue of *Municipal Affairs* by permission of the editor

ordinance, the Municipal Art Society of necessity considered and prepared a scheme to meet, as fully as possible at present, the conditions stated. This scheme is briefly as follows:

All streets should be marked by a sign placed parallel with the street at each corner. This is the universal custom in all cities. While there is an argument for having the sign designate the cross street, experience has shown that such a method is extremely confusing and impracticable.

THE BEST LOCATION

Generally, signs should be placed on corner buildings, or, where there is no corner building, on a temporary sign-post erected on the corner lot. If, however, the owners of the building or lot do not consent to this, or, if the official having charge of the matter consider that it is impracticable because the building does not lend itself to such purpose, or is covered with other signs, or for any other reason, then the signs should be placed on at least two corner lamp-posts or other standards diagonally opposite each other. It is probable that every lot owner will consent to the use of his property for this purpose. Public opinion will compel it. But the plan contemplates that it may not be legally possible to compel him to do so. The sign on the building is much more stable and less liable to injury or defacement than a glass sign on a post in the street. But if the latter may be properly illuminated at the proper height—that is, for instance, if the cost of an illuminated sign on an electric light pole be not substantially prohibitive—its superiority is immediately apparent. A sign on an electric light pole, at the proper height, would be almost useless at night unless illuminated, at it would be wholly in the shadow cast by the lamp.

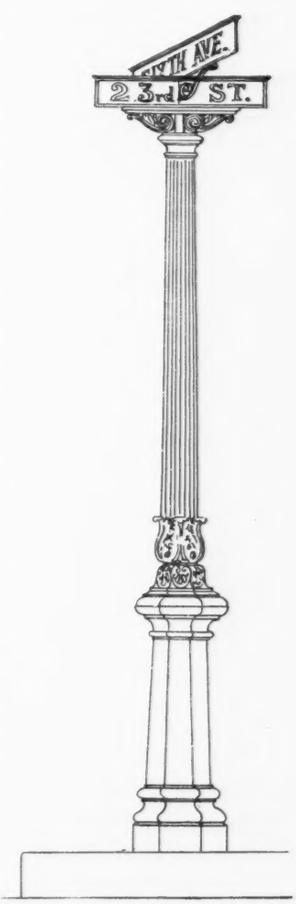


So far the law may be rigid. Some sign must be provided. But beyond that a very large discretion should be vested in the executive authority. A system which is suitable for one portion—for example, the congested or thickly-populated portion—is not suitable for its outlying parts. A construction, which we hope some time to see, combining all the city's street utilities, which is entirely suitable in thickly-populated districts, signs a well-populated district. In would naturally be substantially uniform, and much more attention can be given to them than in a thinly-populated district. In the latter, where the region is unbuilt, a plain post with a sign of the most ordinary character will be sufficient as a temporary designation, or the lamp-posts formerly in use can be moved to such districts and utilized for the purpose. It is quite as necessary to inform a stranger of the name of a street in such a region as it is in the more thickly-populated portions. It is indeed a little more so, because other information is not readily at hand. But it is not as necessary that the signs themselves should be costly, and the expense will naturally be reduced to a minimum.

MUST BE VISIBLE FROM STREET CAR

Nor should the law undertake to fix the character of signs. Designs for signs to be used on buildings will necessarily be very different from those to be used on street lamps or other structures. Discretion is exceedingly important to satisfy the demands of the two classes of persons referred to. This it is not possible to do except by treating them separately. There is no method which will mark the street for a stranger with a parallel sign, and at the same time properly and quickly inform a traveler in a modern trolley car of the cross street. These cars move so swiftly that even their conductors are unable to say at once where they are. The name of the cross street cannot be read from a car parallel with the cross street, and, if parallel to the street being traveled, the fact is extremely confusing. If the sign parallel with the avenue of transportation have also, as has been proposed, the name of the cross street, the latter cannot be read unless the lettering is equally large, and that is again confusing and impracticable. To be read from a car, the sign cannot be placed on a building, because it will be too distant and often at a wrong height; it must be placed on the curb, and at a height to be seen from each side of the car.

The demands of the two classes of persons are opposite—one for a sign parallel with the street, and the other for one across it, or, better still, at an angle with it, so as to be read in approaching as well as passing it. The proper official should, therefore, be vested with the discretion of maintaining two sets of signs. In streets on which are operated street railways, or which are used almost exclusively for driving purposes, the official should be authorized to utilize any posts at the corner of the street, or to erect them for the purpose, on which signs may be placed indicating the name of the cross or intersecting street, at about an angle of forty-five degrees. These would be placed on diagonally opposite corners. A passenger in a streetcar could then readily read the sign he may be approaching, and from it ascertain the name of the cross street. It would quickly become well understood that these signs placed at this angle indicated solely the cross street, or, if necessary, to avoid confusion to pedestrians, the fact could be stated on the sign in small letters that the sign was for the cars only. This mainttenance of two sets of signs would be necessary only on avenues or streets largely used for transportation. They would be unnecessary on residence streets or those on which there are no street cars. Which signs should be used should properly be determined by the official having authority in the matter.



NOTE—On page 45 will be found signs which are adapted to the electric arc lamps here and elsewhere. Some of them are already in use.

(To be concluded in February.)

MUNICIPAL JOURNAL AND ENGINEER

AMONG THE IMPROVEMENT CLUBS

National League of Improvement Societies—Buffalo's Awakening—Interest of Horticulturists—Big Plans at Chicago—Notes From Bar Harbor and Arkansas

By Charles Mulford Robinson

In an illustrated and attractively printed pamphlet of eighty pages the American League for Civic Improvement has just issued the stenographic report of the proceedings of its annual convention, 1901. Printed under the general title, "The Twentieth Century City," the pamphlet is a good deal more than merely the record of an annual convention. It is a year's record of the work accomplished for civic betterment by scores of federated societies throughout the United States, and as such it is full of inspiration, encouragement, and suggestion. If the League did nothing more than issue such a summary every year, its existence would be fairly well justified. But not less interesting than the record of achievements are the pages that give the purposes and hopes of the League for the years to come.

THE LEAGUE'S PURPOSES

The convention was held last August in Buffalo, and marked the close of the League's first year of existence. During that year an effort had been made to get into touch with associations already organized for local improvement work. Some 300 were reached; but the canvass was very incomplete, and the corresponding secretary estimates that there are about a thousand such organizations now at work in the United States. The purpose of the American League for Civic Improvement is to join these societies in a central body for their mutual benefit. "It has been found," says the corresponding secretary, "that hundreds of societies organized within the last few years have become inactive. The need of a central organization like the League is amply demonstrated by this fact. A source of inspiration and enthusiasm, it will be able to make more permanent the average of local societies."

As a central body, the League aims to serve as a clearing house for ideas and information, emphasizing the best means for gaining desired ends; to secure general interest by an extensive press and platform agitation, and to arouse an intelligently responsive public sentiment through educational literature and popular addresses. The League has an open field, does not rival existing organizations, and is in no sense a legislative body. Its very practical conception of its field for work is shown in its establishment of an extensive news service, its preparation of photographs and slides for the use of speakers, its advertisement of, and circulation of, pertinent literature, its suggestion of programs for meetings and clubs, its provision of a lecture bureau, and its ready assistance in the formation of new organizations. Meeting only in an annual convention, the members of which are delegates from widely scattered societies, its vigorous daily work is not for itself, but for the Cause.

MEMBERSHIP IN THE LEAGUE

There is little reason for surprise, then, that the League has grown rapidly in membership, and hence in influence and power. Its appeal is broad. Societies for any phase of improvement work in village, town or city may join it, the dues in this case being $2 for each hundred members or fraction thereof. This carries with it the right of representation and voice at the annual convention. Individuals in sympathy with its purposes also may, and a great many have, joined the League, the annual dues being $2, or such larger sum as the donor may elect, in order that the work may be the better prosecuted. And finally, commercial memberships may be taken out by business firms who are interested out of public spirit or because they see financial advantage to themselves in the influence of a propaganda for public beauty. In the latter list there are many nursery men and publishers and manufacturers of city machinery who are very willing to pay the $10 required of them for dues. So the League, wisely gathering its force from various elements, converts it all into public spirit and concentrates it on the effort for public beauty and better living in town and city.

It is somewhat remarkable that a society started only a year ago, and a bit obscurely, in Springfield, Ohio, has grown so quickly to national importance. Thirty-seven states are now represented in its membership list, besides the District of Columbia, one territory, the Philippine Islands, Canada, and Nova Scotia, and on the roll of its executive board are the names of many of the men and women most prominent in the United States in civic improvement work. The board is composed of the following: Professor Charles Zeublin, University of Chicago, (president), E. L. Shuey of Dayton (first vice-president), Mrs. Conde Hamlin of St. Paul (second vice-president), Henry Metcalfe of Cold Springs, N. Y. (third vice-president), Frank Chapin Bray of Cleveland (treasurer), E. G. Routzahn of Dayton (corresponding secretary), Charles Mulford Robinson of Rochester (recording secretary), Charles M. Loring of Minneapolis, Albert Kelsey, of Philadelphia, H. B. Beck of Austin, Texas, W. H. Moulton of Cleveland, John L. Zimmerman of Springfield, O., Miss Mira Lloyd Dock of Harrisburg, Pa., and D. J. Thomas of Springfield, O. The League's headquarters are in Springfield.

THE LAST ANNUAL CONVENTION

Lack of space prevents extended review of the convention proceedings, which are printed in full with the carefully prepared papers by prominent leaders, also the verbal reports of work locally accomplished—as reported by delegates present from Iowa, from Spokane, Wash., from Harrisburg, Pa., from St. Paul, from Austin and Galveston, Texas, from Marissa, Ill., and from Tarpon Springs, Florida. As to plans for the future, the inaugural address of President Zeublin laid emphasis on the good to be expected from the proposed model city exhibit at St. Louis, endorsed by resolutions passed at the convention of the League last August. These resolutions, soon followed by seconding resolutions passed by the Architectural League of America, were sent to the Exposition authorities that month. It notes that the directors of the Centennial Exposition to be held in Portland, Ore., have sent to the League for advice, as have the authorities at Manila. It explains the work which the League is doing, in educating, stimulating, and organizing. It invites correspondence upon all the subjects in which the League is interested, promising that every effort will be made to give the information required. It gives, in brief, convincing evidence that among the improvement clubs to-day there is no force of better opportunity and larger promise than this League, composed of the affiliated clubs themselves.

BUFFALO'S AWAKENING

The last month witnessed in Buffalo, where the League met in the summer, a strong awakening of tangible interest in civic improvement. Early in the month the Delaware Avenue Improvement Association was formally incorporated with nineteen directors, of whom three are proprietors of newspapers, indicating that the society's good deeds will not be hidden under a bushel nor its appeals lack for press support. There will be felt in the progress of this society, which includes among its incorporators such well known names as those of ex-Postmaster General Wilson S. Bissell and of John G. Milburn, an interest more widespread than is accorded to most street improvement associations. For, as the show street of Buffalo, Delaware avenue, came in for a large share of attention from Pan-American visitors, while President McKinley's battle for life in a home of that thoroughfare centered the gaze of the world on the street. It is suggested that the matters to which the association is likely first to turn its special attention are, the care of the street trees and the threatening invasion of apartment houses.

On December 16th there was formally organized at a mass meeting in Convention Hall, the Society for Beautifying Buffalo. This was the outcome of plans that have been quietly maturing for almost a year, a good earnest that the effort is determined and sincere. The speakers included the mayor, the president of the Buffalo Fine Arts Academy, and Dr. Matthew D. Mann, who is a park commissioner and probably the most enthusiastic worker in Buffalo for the cause of

city improvement. There was read also a letter from the mayor-elect pledging his cordial co-operation with the society's efforts when he assumes his office. It was resolved to rent a room down town for the society's headquarters, and to incorporate it, a long list of prominent men and women who have pledged active support being named as directors. Dr. Mann, in taking the chair, made an address in which he called attention to the "great æsthetic wave which is spreading over the world." In outlining the plans of the society, he said: "We do not propose to advocate any schemes for burdening the city with an increased bonded indebtedness, or for increasing the taxes. * * * * We believe that much can be accomplished without expending large sums of money, and that what money we need can be raised outside the city treasury by the friends of the movement. It is mainly by influencing public opinion that we hope to accomplish our ends." Coming then to the details, he said that it was proposed to delegate the work of the society to some fifteen committees. These committees will have various functions to perform. There will be, for instance, the committee on architecture. Its work will be largely advisory and repressive, rather than suggestive. "Its object will be to prevent the erection of buildings whose architectural designs are not correct, and to use all the power of the society and the influence of public opinion to have bad plans changed for good ones." It will also consider the framing of building ordinances. Other committees will be those on the smoke nuisance, on billboards and advertisements, on overhead wires, on mural decorations, on parks and public squares, on trees, etc., etc. In a personal letter to this department, written a couple of days after the meeting for organization, Dr. Mann says: "Our society has started off very well. We have already had one subscription of a hundred dollars a year, and one life membership of a hundred dollars, offered without solicitation. The regular individual dues are only one dollar a year. I think the movement has stirred up a great deal of interest in Buffalo."

INTEREST OF HORTICULTURISTS

The thirty-fifth annual meeting of the Minnesota State Horticultural Society, which is the largest in the country, was held in Minneapolis December 3d to 6th. The printed program, as sent to this department, shows the devotion of a good deal of time to the consideration of town improvement work. The first evening session was devoted to an address on the "Improvement of Public and Private Grounds," by the Hon. Charles M. Loring, the "father of the parks" in Minneapolis. The following morning the details of the subject were considered in a series of ten short papers. Among the titles were: "Landscape Adornment a Universal Obligation," "An Ideal Public Park," by the superintendent of parks in St. Paul, and "Parks for Smaller Towns." At the joint session of the Ladies' Auxiliary, in the afternoon, the topics discussed included "School Gardens," "The Possibilities of Club Work," and "An Amateur's Notes on Outdoor Improvement," the latter by Mrs. Loring. If the impetus which may be given to town improvement work by such societies be not entirely disinterested, as it certainly is not, it may yet be very practical, full of suggestive hints and rich in an expert advice which is sometimes sorely needed.

CHICAGO'S BIG PROPOSAL

There has been a good deal said in the newspapers about a plan proposed in Chicago to increase enormously the membership and financial resources of the Municipal Art League. The plan as published was to interest all clubs, societies, and the employees of large factories and mercantile establishments, until the membership of the League, recently about four hundred, had been raised to half a million and its resources, with annual fees of $2, to a million dollars a year. It was a stupendous plan well calculated to call forth newspaper headlines. A committee of very good men was named as having the matter in charge; but one of them, in a personal letter to the MUNICIPAL JOURNAL AND ENGINEER, says that the newspaper account is representative of the views and hopes of the chairman rather than of the whole committee. There are, he adds, in Chicago and its suburbs, a couple of score of local improvement societies, and the most practical effort now is to bring these together. That is a wholly good purpose, as distinctly to the benefit of the clubs as of the city. It may be that the Cook County Conference, described last month, was a first step in this direction. Of the other plan, if there were any danger of its success, one would have to be distrustful. It is going altogether too fast for the present state of popular taste in matters of civic art. A small committee that studies much, thinks deeply, has pure ideals, and commands general respect, can do far more for a community than can a society with five hundred thousand members and the temptation of an annual fund of a million dollars. But Chicago, as *The Outlook* says, is one of the best cities in the Union in which to conduct the experiment on a large scale because it is pre-eminently pervaded by the sense of civic unity. "Every man who succeeds in Chicago feels that he must do something for the city; that, in a certain way, he is in partnership with the community" and owes to it some share in his profits. For this reason, as the advance guard of a possible reformation which, ultimately indeed, can be accomplished only by a whole populace, the suggested experiment of the Chicago Municipal Art League will have a very widespread interest, if it can be made.

A YEAR'S WORK AT BAR HARBOR

The annual report of the Village Improvement Association of Bar Harbor, Me., comes in the form of detailed reports from its various committees. This is a very convenient form for reference, and very practical. The committees are on "Tree and Roadside," "Bicycle Path," "Village," "Sanitation," and "Roads and Paths." The scope of the association's work is fairly indicated by the names of these committees. For the coming year the village committee was given $700 to spend; to the committee on trees and roadsides a like sum was appropriated, and to the committee on paths $400. An interesting work done, and new enough to be suggestive, was that of the Bicycle Path Committee. It reported not only the planting of trees along the wayside, but of wild looking vines to cover some of the fences; and at points where openings had been left to command the fine views, the setting out of low growing and decorative plants. Bicycle paths very seldom receive æsthetic attention.

ARKANSAS SUGGESTIONS

From Bar Harbor to Arkansas seems a far cry, and the distance in village improvement work is more than that of miles so fully is the financial aid of fashion on the one side. But, happily, of the four factors that count most the first is spirit, the second is taste, the third is willingness to work, and wealth is only the fourth. With the first three Arkansas is well supplied, and the department of the Helena *World* which weekly chronicles the club work of Arkansas contains in the course of a month many items of interest and encouragement. Among the latest is the report of a meeting held at Vincent to organize a Civic Improvement Society, at which more than $50 was donated, as a "starter." The primitive practicalness of the work required is indicated by the statement that good sidewalks will be the first consideration. Subsequently Arbor Day was celebrated by the planting of twenty-three trees. Mrs. William M. Neal, the acting president of the Arkansas Federation of Women's Clubs and a leader in city improvement work, writes in a personal letter: "There is a good deal of interest in town improvement in Arkansas; but, except in a few instances, the work has to be of an humble kind. The small towns are passing stock laws, starting sprinklers, inaugurating tidy boxes, and planting trees. Here in Helena one of the women's clubs has secured permission to beautify the grounds of the government building—a work that meets with some opposition, some citizens thinking that the government should do its own beautifying—but we have made bold to look after the mowing of the grass, have planted a few trees, and last summer had a big bed of cannas and a fence border of cannas and golden glow." Sympathy may properly be felt for the protesting citizens, for certainly the government ought to beautify its own grounds. But there is this to be said: If the government fails in this duty, the failure, which does not much injure the government, injures the town so sadly that the latter may fairly, for its own sake—and not at all for the government's—undertake to correct it. Another suggestive item from Arkansas appears in the report of the village improvement committee of the Cosmos Club of Forest City. It appears that the committee has appealed to the "ladies' societies of the churches to aid in putting the church grounds in order, planting trees, etc." The improvement and care of its grounds by every church ought to be deemed so clearly a part of its Christian duty to the community that no religious society would dare to show itself delinquent in it.

MUNICIPAL JOURNAL AND ENGINEER

PUBLISHED MONTHLY AT 253 BROADWAY, NEW YORK CITY

C. M. PALMER, PROPRIETOR

WILLIAM S. CRANDALL, Editor
WEBSTER WAGNER, Assistant
J. W. HOWARD, Engineering Editor

JOHN B. BENNETT, Business Manager
E. J. HERMANS, Manager Western Office, 520 Monadnock Block, Chicago, Ill.
Advertising Department:
E. T. WHITE CLAUDE G. DUNN

TERMS OF SUBSCRIPTION
(In advance.)

United States and Canada	$3.00 per year
Foreign Countries	4.00
Single Copies, each	.25

Entered at the New York Post Office as second class matter

NEW YORK, JANUARY, 1902

ASPHALT SPECIFICATIONS OF NEW YORK

THE asphalt pavement specifications are at present the subject of much discussion in the New York press. Some of the statements made have been exaggerations. A careful examination of the specifications themselves for the years 1900 and 1901 indicates that they could be recast, and include additional kinds of asphalt pavements under safe technical requirements. Competition is the question. The price, except on a few streets, is not high, when the high cost of laying and maintaining asphalt pavements in New York is considered. Including the cost of maintenance for equally long periods of time, New York pays less for asphalt pavements than Paris, Berlin and London.

The specifications of New York formerly mentioned, by name, one kind of asphaltum as required in the pavement mixture. Then others were admitted on similar lines, but, the specifications first contained the name of a certain asphaltum, and now an approximate description by tests of the same asphaltum from one general source, as a standard for others. There are other kinds of crude and refined asphaltum which can be made into excellent street pavement mixtures, but which do not agree in all details with the special tests for the one kind approximately described.

The asphalt-rock pavements of limestone, sand-stone or a combination of the two, impregnated naturally with asphaltum or bitumen, have been used successfully for more than forty years in European cities. The old European and new American asphalt-rock asphalts have been making progress in several cities of the United States. The specifications of New York should require not two and one-half inches of asphalt-rock pavement on the concrete foundation, but simply two inches, the same as laid under much heavier traffic in large European cities. The extra half inch required possibly keeps them from competing in New York. They probably cost a little more to lay, but are less expensive to maintain.

The New York specifications do not provide for the use of certain American asphalt rock from Kentucky, Utah or California, which, if freight would permit, might well be considered as available. The specifications should at least permit their use.

The present specifications give minimum and maximum requirements which strongly point to one or two kinds of asphalt from the same general source of supply. A few requirements seem to demand the exact tests found in the official records of Washington and elsewhere, which apply to an asphalt from one source, or possibly a few selected lots near that source, and hence should be changed.

The specifications cannot be discussed in detail here. A few points suffice to indicate that they need recasting and broadening to secure full competition. The quantity of bitumen in refined asphalt is commercially important, but the specifications should give more details concerning the quality of the bitumen and discuss the foreign, organic, mineral and other substances which should be permitted or forbidden.

Samples of materials to be used should not be deposited four days before the time of receiving bids, because, in practice, the names of the intending bidders and often the materials they expect to use become public knowledge before the bidding. This permits a possible collusion with a dishonest city official or employee, and the rejection of samples submitted by persons not acceptable to an administration, or an understanding between bidders. The requirement to deposit 5 per cent. of the price previous to bidding is another unsafe loop-hole against sealed competitive bidding. The clause requiring new bidders to file certificates of work in other cities should be modified. They at least should not be filed before bidding. They should submit their samples, bids and bondsmen the same as others. The city authorities should afterward investigate to see if the new bidder comes within the technical and other requirements of the specifications, and before awarding the contract. Asphalt paving is not a new branch of engineering, but is successful in various forms since 1854 in Europe, and since 1876 in the United States. There are many engineers with sufficient experience to devise technical requirements which would secure good pavements even if apparently new. If a new and untried class of asphalt pavement is presented the city could pay for all work except the asphalt surface, withholding the payment for the surface for two years, which would determine here, as in Berlin, the efficiency of that class of pavement.

The specifications should not be limited to American Portland cement. They should permit any Portland cement meeting the tests. They should provide tests and mixtures for good natural cements, and Puzzolan cements. These three classes of cement are reviewed with tests based on the United States army engineers' recommendations, published in the October issue of the MUNICIPAL JOURNAL AND ENGINEER. Cement in bags should not be forbidden by the specifications but permitted, when properly protected. Additional competition would be thus assured.

The binder, or bituminous concrete layer, should be described more in detail, and not left as "acceptable to commissioner."

The words "standard pavement mixture" could be changed to read "asphalt pavement wearing surface." Then descriptions of different kinds of asphalt pavements could follow, described separately as to the requirements for each. There are several methods of making good asphalt pavement mixtures from materials from different sources as well as preparing them from different asphalt rocks, also combinations of the two systems. It is not best to attempt to group them directly or indirectly under any one standard mixture.

The asphalt cement could well be more fully described and additional tests inserted. It is the asphalt cement which holds together the other components of an asphalt pavement mixture. The bituminous flux which is used with refined asphaltum is fairly well described, as far as residuum oil of petroleum is concerned; but more details concerning liquid asphalt or maltha should be inserted. The greatest possibilities of competition lie in the use or combination of various refined asphalts with one or more fluxes. Good results follow if undertaken under educated, experienced, diligent and honest inspection. The tests for sand for the asphalt pavement mixtures could be more extended to check the work.

The paragraph on "rock-asphalt" would better read "asphalt-rock pavements," and describe in detail those made from American asphalt-rock and separately those from European asphalt-rock which differ in their composition and methods of use.

The provision allowing asphalt "equivalent or superior" seems good, but the latter part of the same paragraph indicates a limit in respect to the asphalt mixture pavements, and refers to but one class of asphalt-rock pavements.

The maintenance of asphalt pavements, means future cost to contractor and city. In justice to both, the specifications should be

more explicit in describing the condition of repair during the period of guarantee and at its close. This is a matter of contention in many cities, and will be one difficult to settle in future years.

The city of New York has specifications which secure good asphalt pavements, but the city could more fully investigate this branch of engineering and provide fuller and broader specifications with a view to securing additional competition and equally good results.

J. W. HOWARD.

EDITORIAL COMMENT

ACCORDING to a news item in the Kansas City *Star*, that municipality is suffering from the "pole nuisance." From the description of our contemporary that nuisance seems to be self-evident. We wonder why, instead of giving valuable space to the description of a state of affairs which is so patent to every citizen, it does not give some attention to the discovery of a remedy for the nuisance. Many cities in the East have already put their wires under ground in the business section. It would be well for Kansas City to follow their example and apply the same remedy.

AN item has been going the rounds of the press to the effect that the city of Akron had gone into the hands of a receiver. This is an error, as the editor of the *Beacon Journal* of that city writes: "It is not true that Akron has gone into the hands of a receiver, nor is it likely to be. The item that got into the press was sent out by a newspaper correspondent who had more regard for making money than for maintaining his reputation for veracity. The city is badly in debt because of public improvements and some extraordinary expenditures, but the city will not go into the hands of a receiver."

THE work of the Municipal League of Philadelphia, under the leadership of Clinton Rogers Woodruff, is progressing satisfactorily. While it is slow, it is sure. The fact that more than 90,000 votes were polled for the candidates named by the league during the recent campaign is most encouraging. This organization is endeavoring to correct some of the evils in the Quaker City along the practical lines suggested by the work of the Municipal Voters' League of Chicago. Notwithstanding the indifference which still exists, there are many reasons to hope that the troubles of this city will continue to grow less.

MR. J. N. ADAM, of Buffalo, is quoted as saying that, "If the water works belonged to a private company they would be capitalized at probably $20,000,000, whereas they are worth only $8,398,574, with bonds against them for $3,711,882, leaving a balance in favor of the taxpayers of $4,686,692." A still better showing could be easily made if the meter system were gradually introduced. As we have remarked on several other occasions, there is no city so needlessly wasteful in its use of water as Buffalo. The general use of meters in Buffalo would be the means of saving tens of thousands of dollars a year to the taxpayers. It is a short-sighted policy to continue to waste the people's money.

ACCORDING to a press dispatch, a Michigan farmer recently brought suit against the township of Lincoln for $10,000 damages, for injuries received because of a defective road. The plaintiff was thrown violently to the ground, breaking a leg and injuring him otherwise, because the wheel of his wagon fell into a rut of a defective road. Negligence on the part of the township to keep the roads in good order was proven, and the jury in the case gave a verdict of $2,000 in favor of the plaintiff. The authorities of that town should take the advice of the "good roads Senator" of that State, H. S. Earle, and keep its highways in a better state of repair. It would be wiser to invest a few thousand dollars in road making machinery than to pay the costs for a lawsuit and the damages which result from accidents.

MUNICIPAL affairs in Porto Rico are becoming more interesting and the officials are pushing along improvements at a rapid rate. Mayor Mateo Fajardo, of Mayaguez, has recently advertised for sale the city's bonds to the amount of $200,000. It is proposed to use this loan for the payment of the floating indebtedness of the city, the purchase of the electric plant now owned by a private company, the construction of a sewerage system, the repair of the abattoir or the construction of a new one, the completion of water works, the repair of the public buildings of the city necessary for their preservation, and the repair of streets and roads in charge of the municipality. The total assessed valuation of the taxable property of this city for the year 1901, amounts to $7,050,800. Mayor Fajardo evidently belongs to the progressive type of Porto Ricans. He is a good example for others to follow.

MAYOR BOOKWALTER, of Indianapolis, is determined to reduce the smoke nuisance to a minimum. He has just returned from a visit to Chicago, and he says "Smoke can be consumed. I have seen it burned up and am prepared to meet any statement that smoke consumers and smoke prevention by the down draft furnaces are ineffectual. I am convinced that there has been too much delay in enforcing the ordinance for the abating of this nuisance in Indianapolis." Mayor Bookwalter is right in this matter. It is only because city officials will not enforce an ordinance, or because the local or State legislation is so defective that it cannot be enforced, that the evil continues to exist in many communities. New York and other Eastern cities are not troubled in this way. Cleveland, where a large amount of soft coal is consumed annually, by the vigorous administration of a Smoke Inspection Department, has largely reduced the volume of smoke in that city. What Cleveland has done Indianapolis and other cities can do.

WE spend millions of dollars every year in our municipalities for permanent pavements, and more millions in the country for better highways, and then permit the use of the destructive narrow tire. It is impossible to estimate the amount of annual damage to good pavements and good roads resulting from the use of narrow tired vehicles. In the city trucks with heavy loads cut up and rut the pavements, making it necessary to expend, in the aggregate, throughout the country, millions of dollars for repairs; and the same is true of rural conditions. It is high time that city and country united their influence in advocating the adoption of State, county and municipal legislation which should provide for the equipment of all wagons with wide tires. The counties of Monroe and Ontario, of New York State, have recently adopted resolutions favoring such a measure, with a provision for a $25.00 penalty for a breach of the ordinance. This is a matter which demands the immediate attention of municipal officers.

OUR contemporary, *The Tribune*, of Minneapolis, recently had a valuable editorial upon "Filters in Operation," which contains several slight errors about mechanical filters. The mechanical filter has reached that point of perfection where even many experts, who formerly favored the slow sand filter, see little reason why the slower method should be employed in place of that of the more rapid mechanical filter. A filter plant is now being constructed for the East Jersey Water Company, at Little Falls, N. J., which will have a daily capacity of 30,000,000 gallons. When completed it will be the largest mechanical filtration plant in the world. This system of filtration has been adopted by over 148 cities in the United States alone, and many others are now building, so that the statement of *The Tribune* that American cities are holding off on the filter question can hardly be correct. The thorough tests which have been made of both systems have been so satisfactory that the matter of expense alone should favor the choice of the mechanical filter. As compared with the slow sand filter the mechanical filter is much less expensive. The city which has its water supply to purify will make no mistake in adopting the mechanical filtration system.

SOME of the city officials of Bay City, Mich., rather question the advisability of renewing the city's membership in the Municipal League of that State, at a cost of $10,000 per year. It was argued

that the city received no benefits from the organization. If that be true, it is the fault of the delegate who represented the city, for State leagues are among the most helpful organizations in the development of the modern city. In a league of this sort the cities have an opportunity of combining their strength to fight unwise or harmful measures in the State Legislature. It appears from the news dispatch that this particular city has been in the habit of sending only one delegate to the annual meeting of the league. If it were to invest a little more money and send at least three delegates, and upon their return demand a report, much better results would be realized. There are many good reasons why every city in Michigan should belong to the State League, not the least of which is the mingling with their fellow officials at the annual meeting. Such a league, if properly conducted, will furnish protection to municipalities against the encroachments of private contractors and corporations. It also provides for an interchange of ideas among the various city officials as may be desired through the year. While memberships are held in the name of the municipality, every city official is entitled to profit by its benefits.

IF cities were more cleanly there would be less smallpox, diphtheria and other infectious diseases. This statement seems to be borne out by the result of vigorous municipal housecleanings that have been carried on in the cities of Cleveland, Ohio; Camden, N. J., and elsewhere in the United States. A statement of facts relating to Cleveland will be sufficient proof of the correctness of the above. For example, the city of Cleveland fought smallpox with vaccine points and quarantine regulations for several years and failed to conquer the disease. According to the report of the Health Department, there were over 1,200 cases in that city between January and September of last year, but since the latter month no new case has originated. Rather than depend altogether upon the old methods, the new health officer, appointed by Mayor Tom L. Johnson last July, opened a campaign against smallpox in its lair of dirt. He sought out the slums of the city, and with a force of assistants provided with formaldehyde and fire, led them out to disinfect the city, clean up the allays, yards and cellars, and burn the garbage. Instead of simply taking the defensive, he conducted a most aggressive warfare. Upon the announcement of a case of smallpox this health officer, with his small army would swoop down on the district and thoroughly disinfect every building in the neighborhood. In nearly every instance not another case appeared in that district. As a result, in a little more than three months Cleveland was cleared of the pest, and during that time there was not a single case of vaccination. This result seems to justify Dr. Friedrichs, the health officer, in his assertion that "Cleanliness and disinfection are more effective against smallpox and all other contagious diseases than anything else known." He says that "vaccination is all right when the virus is pure, but that its use in no wise should lessen the efforts of a health officer to keep the city clean." What has been learned here should be heeded in other cities.

DOUBLE COURSE OF BRICK FOR PAVING

TOPEKA, Kansas, Dec. 10, 1901.

Editor, MUNICIPAL JOURNAL AND ENGINEER:

In reply to my question of the 23d of November, you make reply that you know of no cities that are using two courses of brick on sand for paving. My object in asking the question was to put myself in communication with cities paving with two courses of brick, for the purpose of getting some new ideas, as I am revising my specifications.

I am greatly surprised to learn that the practice of paving with two courses of brick has been abandoned. The city of Topeka has been paving with two courses of brick since 1889, and now has 305,659 square yards, or 17.3 miles of two-course brick pavement on sand. In the twelve years that this pavement has been down it has not cost one dollar for repairs, and is now in good condition.

Some of our reasons for preferring two courses of brick on sand are as follows: It is less noisy, as it does not have the hollow, rumbling sound that results from one course of brick on a concrete foundation. This city is at present, and will continue for some time to come, putting in gas, water and sewer connections, after the pavements have been laid, and the repairing of the two courses of brick on sand is an easy matter and cheap as compared with the cutting and repairing involved where one course of brick is laid on a concrete base. This saves money, also, for the property owner who puts in the service.

We have two vitrified brick plants within five miles of this city and there is, of course, a per cent. of brick from each burning which is not fit for the top course. By using these, which are hard burned, for the bottom course and the perfectly burned brick for the top course we get our brick at a lower rate, and, as a result, the pavement costs us less than $1.25 per square yard. I am at present preparing specifications for about 10,000 square yards of two-course brick pavement, the contract for which will probably be awarded some time in February, 1902.

JAMES F. MCCABE, *City Engineer.*

If there are any other cities, American or foreign, which continue to lay brick pavements in two courses on a sand foundation, we should be glad to receive their experience.—[EDITOR.

PERSONALITIES

—Mr. A. E. Walker has been elected mayor of Florence, Ala.

—Hon. John Arbuthnot has been re-elected mayor of Winnipeg, Manitoba.

—Col. Sebastian Gunther has been appointed Chief of Police of Louisville, Ky.

—Mr. Bertrand T. Wheeler, Superintendent of Streets, Boston, Mass., has resigned his position.

—Col. Frederick E. Boothby, Mayor of Portland, Me., has been re-elected by a majority of 320 votes.

—Mr. Cornelius Vanderbilt Jun., M. Am. Soc. C. E., has been appointed a member of the Civil Service Board by Mayor-elect Low.

—Mr. Thomas Thompson, who disappeared from Chester, Pa., some years ago and whom his family mourned as dead, is now Chief of Police of Honolulu, H. I.

—Mr. Frank J. Schnauber has been appointed City Engineer of Syracuse, N. Y., to succeed Mr. C. A. Sweet. Mr. Schnauber is a graduate of the class of '88 of the University of Syracuse.

—Mr. Aaron R. Thompson, Superintendent of Repairs of the Middle Division of the Erie Canal, has been appointed Commissioner of Public Works of Syracuse, N. Y., by Mayor-elect J. B. Kline.

—Mayor-elect Knight, of Buffalo, N. Y., has appointed Dr. Walker D. Greene Health Commissioner to succeed Dr. Ernest Wende. Dr. Greene has served nineteen years in the department, and was Assistant Health Officer under the last administration.

—The German millionaire, Jacob Plaut, who died in Nice last February, left the greater part of $2,000,000 for charitable purposes and institutions in Berlin, Hamburg and Saxon cities. More than three dozen institutions in Berlin alone were remembered by him.

—Health Commission Dr. Justus Ohage, of St. Paul, Minn., has been invited to deliver one of a series of lectures on municipal and national questions, projected by the Manufacturers' Club of Philadelphia, Pa. His subject is to be "Sanitation of Our Larger Cities."

—Mr. Rudolph Hering and Mr. George W. Fuller, hydraulic engineers and sanitary experts, with offices at 100 William street, New York City, have been engaged to review plans for water supply, water purification and sewage disposal for the city of Manzanillo, Mexico.

—Several of the friends of ex-Mayor Morris, of Ottawa, Can., have threatened to take action against the whole City Council by laying

similar charges to that which disqualified the Mayor. The ex-Mayor, however, has declared against any such action on the part of his friends.

—Professor Edward W. Bemis, Superintendent of Water Works, Cleveland, O., has issued a report on the "True Value of Ohio Railroads for the Purpose of Taxation." Professor Bemis prepared this at the request of Hon. Tom L. Johnson, Mayor of Cleveland, who has been carrying on a fight against the low assessments on the Ohio railroads.

—Hon. Denis Mulvihill, the "stoker mayor" of Bridgeport, Conn., has been making a strenuous fight against the building of a new city hall in the city. Mayor Mulvihill's policy is to be retrenchment and he considers the building of a new city hall an extravagance not to be tolerated. He thinks that if the old building is fixed up it will do very well.

—The following have been appointed to fill official positions in Albany, N. Y.: Corporation Counsel, Mr. Arthur L. Andrews; Commissioner of Public Safety, Mr. Edward B. Cantine; Commissioner of Public Works, Charles M. Bissell; Commissioner of Charities and Corrections, Mr. William H. Storrs; City Engineer, Mr. Walter Melius; Chief of Police, Major James L. Hyatt.

—Col. George W. Stillwell, an inspector in the Street Cleaning Department in Brooklyn, N. Y., and who was probably the oldest municipal employee, died in the early part of December. At the beginning of the Civil War he raised a company which was mustered into the Sixty-seventh New York Volunteers as Company B. He was ninety-one years of age at his death.

—The League of Tennessee Municipalities recently held its first annual meeting in Nashville, Tenn., and elected as its president, Hon. James M. Head, Mayor of Nashville; first vice-president, Hon. A. W. Chambliss, Mayor of Chattanooga; second vice-president, Hon. W. A. Folkes, Jr., Mayor of Dyersburg; third vice-president, Hon. W. D. Cameron, Mayor of Columbia; secretary and treasurer, Hon. J. W. Blackmore, Mayor of Gallatin.

—Mayor-elect Seth Low, of New York, has made the following appointments to office under his administration: Corporation Counsel, George I. Rives; Commissioner of Charities, Homer Folkes; Commissioner of Bridges, Gustav Lindenthal; Commissioner of Police, George N. Partridge; Commissioner of Street Cleaning, Dr. John M. Woodbury; Health Commissioner, Dr. Ernest J. Lederle; Fire Commissioner, Thomas Sturgis; President of Park Department, William R. Wilcox; Commissioner of Docks, McDougall Hawkes; Commissioner of Correction, Thomas W. Hynes; President of the Department of Taxes and Assessments, James L. Well; City Chamberlain, Dr. E. R. L. Gould.

—The following mayors have been elected to office in Massachusetts cities: Brockton, Mr. David W. Battles, Republican, to succeed Mr. Charles H. Coulter; Fall River, Mr. George Grime, Republican; Fitchburg, Mr. Charles Babbitt, Independent; Lawrence, Mr. James F. Leonard, Democrat; Marlboro, Mayor Walter B. Morse, Republican, re-elected; New Bedford, Mayor Charles S. Ashley, Independent, re-elected; Northampton, Mr. Henry C. Hallett, Republican, succeeding Mayor Arthur Watterson; Quincy, Mr. Charles M. Bryant, Independent; Taunton, Mr. Richard E. Warner, Republican; Waltham, Mr. Murray D. Clement, Republican; Gloucester, Mayor William W. French, Independent Republican, re-elected; Haverhill, Mayor Isaac Poor, Republican, re-elected; Holyoke, Mayor Arthur B. Loomis, Republican, re-elected; Chicopee, Mayor James H. Loomis, Republican, re-elected; Springfield, Mr. Ralph W. Ellis, Republican, to succeed Mr. William P. Hayes, Democrat; Boston, General P. A. Collins, Democrat, to succeed Mr. Thomas N. Hart, Republican.

ODD THINGS RELATING TO MUNICIPALITIES

A City Where Debtors Cannot Vote—A Town for Sale—An Inspector "Docks" Himself—A Municipal Saloon—Opera Singer's Voice Hurt by St. Louis' Smoke: He Sues for Damages

INSPECTOR "DOCKS" HIMSELF.—A case of exceptional honesty has come to light in Jersey City, N. J. One of the school inspectors in the twelfth ward is so honest that when he is away from duty for even an hour appraising property for banks, for which purpose he is in great demand, he docks himself for the time so spent. The revelation nearly overcame the director of the ward, and he said that it was a curiosity for a city employee not to make all he could out of his job.

♣

DEBTORS CANNOT VOTE.—It is the duty of the City Treasurer of Montreal, Canada, to publish a notice some time preceding a municipal election to the effect that such election will be held on such and such a date and that all persons who are indebted to the city after a certain date for water rates, business duty, licenses, or personal taxes of any kind will not be qualified to vote for mayor or aldermen at the coming elections. A similar scheme might aid in purifying politics in "The States."

♣

MUNICIPAL MILK STATION.—Battersea, England, is always undertaking new experiments in municipal ownership. The latest venture is the establishing of municipal milkshops where sterilized milk may be obtained. The high infant mortality in the borough has aroused the authorities to make great efforts to provide pure milk for the babies. If the experiment is successful, other municipalities will soon adopt the idea, but, as in many other things, they have allowed Battersea to first solve the problem.

♣

A REAL DARK TOWN.—The colored persons, living in the vicinity of Pratt City, Ala., have come to the conclusion that they are as competent to establish and conduct a city as are "white trash," and, to carry out their ideas, have petitioned the court for an election to decide if they shall have the opportunity given them to found a town of their own. The proposition is to incorporate a town, to be known as Douglas after the great negro statesman, and to have none but negro officials in authority. It is to be presumed that there will be no laws passed prohibiting the appropriating of feathered bipeds.

♣

TOWN FOR SALE.—Because the owner of the town of Molsen, Washington, went into bankruptcy, the town went into the hands of a receiver, and now is in charge of a trustee who is its present ruler. The owner was a mining man who "had struck it rich" and purchased a tract of ground on which he erected stores and dwellings and made himself "czar" of the community. The undertaking was too large for his capital, and he became heavily involved in debt. Creditors forced upon him bankruptcy proceedings, which he resisted, but a trustee has been appointed and the town will now be sold to the highest bidder and the purchaser will have the office of "ruler" thrown in as an inducement.

♣

TO EXTERMINATE CATS AND DOGS.—For some time to come the life of a cat or dog in Buffalo, N. Y., will not be worth much. Meanwhile, in the Polish portion of the city, the police officers will have plenty of practice with the revolver and should become expert marksmen before the small-pox scare is ended. They have been ordered to end the life of any canine or feline that happens across their path, for the authorities have come to the conclusion that the intermingling of cats and dogs from the infected houses is doing much to spread the disease. The men will not attempt to do such fine work as shooting the germs themselves, but will direct their efforts against the carriers of the microbes.

AN AMERICAN CITY IN ENGLAND.—Near Manchester, Eng., there is rapidly being built a new town that will be the home of some 7,000 workmen. The town is unique for England in that it is being built upon strict American lines. The Westinghouse interests are at the back of the work, for their large electrical plant is located nearby, and the inhabitants of the town will be employed in the works. About 1,000 houses have already been erected. The streets are being laid out after the American plan, and instead of being named in the English fashion, are being numbered consecutively. Both the streets and houses will be lighted by electricity. Americans have the work of building in charge, and the whole enterprise is a marvel to the Britisher.

SMOKE HURTS HIS VOICE.—A leading tenor of an opera troupe has filed a suit against the city of St. Louis, Mo., for damage that he claims was done his voice by the smoke in the atmosphere. He was caught in a cloud of St. Louis smoke, which so affected his throat that he was unable to appear at the opening night of the opera. A mandamus has been obtained to compel the smoke inspector to carry out the provisions of the smoke ordinance. It is alleged that the Signor, while walking along one of the principal streets in the city, ran foul of a block of smoke that had escaped from the custody of the smoke inspector. As the singer was a stranger in the town, he had not yet learned to dodge such banks of smoke, and his throat and lungs had not become accustomed to the soothing balm of soft coal.

A MUNICIPAL SALOON.—The newest thing in the realm of municipal ownership is the municipal saloon. The Devonport (Eng.) Corporation has accepted the proposition of the Mayor that steps should be taken to keep in the hands of the city all new licenses issued for saloons. The Mayor said that the granting of licenses often depreciated the value of the adjoining property, and it was not right that this should be a source of profit to individuals. Inasmuch as the municipality had control of the tramways and other public utilities, there was no reason why the control of the beer supply also should not be in the hands of the city. This could be done by granting the licenses to the town, but allowing the applicant for such license to run the business, being known as "tenant manager." The terms of tenancy could be so fixed as to prevent abuses and secure the purity of the supply of liquor. The Mayor hoped that non-alcoholic beverages and solid refreshments would be as easily obtainable as beer and the houses would thus be not merely drinking bars, but places of refreshment as well. Unfair attractions that became an incentive to drinking and finally fixed upon persons a drinking habit, would be absolutely discountenanced. The rivalry between firms was so great that they provided these attractions and the houses thus became a menace to the State and an offense to the public. Were the Council to have control of the houses, all these attractions would be abolished. As regards the administration of the profits accruing from such places, the Mayor suggested that they be applied to the reduction of taxes or to the extinguishing of licens in undesirable neighborhoods.

"I WANT TO BE A MAYOR."—We all know that, preceding an election, the candidates are wont to travel about promising no end of things that will please their audiences and, incidentally, attract votes to their side of the fight. In the following lines will be found a few of the typical promises made at such times and which are promptly forgotten after the office is secured:

I want to be a mayor
  And with the mayors stand,
A bald spot on my caput,
  A gavel in my hand;
My "want to be a mayor"
  Looms up to "beat the band,"
So here's the latest budget
  Straight from the Promised Land.

If I'm elected mayor
  "Dollar gas" will go to stay;
If I'm elected mayor
  There'll be gas to *give* away;
I'll furnish it free gratis
  Alike to great and small—
To all who make connection
  With my room at City Hall.

If I'm elected mayor
  You can safely bet your boots
There'll be for every citizen
  A policy that suits;
There'll be a chance to "liquor"
  For all who care to buy,
While they who are not thirsty
  Will be licensed to "go dry."

If you elect me mayor
  Your taxes shall come down,
And the wicked corporations
  Furnish cash to run the town.
If I am chosen mayor
  I'll make a *sidewalk sally*
For *universal concrete,*
  Even down in Peanut Alley.

When I'm elected mayor
  Every want will be supplied;
There will be a moral influx
  Like the coming of the tide;
All the preachers will be happy,
  And relinquish every care,
When they see a staunch reformer
  Sitting in the mayor's chair.

So I want to be a mayor—
  Yes, I want to very bad;
And it's up to every voter
  To make everybody glad;
For I want to be a mayor
  For the *people's sake alone,*
Though the *will* of the dear people
  Wouldn't mutilate *my own.*

CONVENTION DATES

JANUARY

State Engineering Society will meet at Grand Rapids, Mich., January 7-9. F. Hodgman, Climax, Mich.

State Firemen's Association meets at Edwardsville, Ill., January 14-16. Charles Chaine, Bushnell, Ill.

American Society of Heating and Ventilating Engineers meets in New York City, N. Y., January 21-23. W. M. MacKay, Box 1818, New York City.

American Statistical Association, Boston, Mass., January —. Davis R. Dewey, 491 Boylston street, Brockton, Mass.

Mobile, Ala., will celebrate its 100th anniversary in January. L. de V. Chandron, Mobile, Ala.

FEBRUARY

Charities and Corrections State Conference will be held at Lincoln, Neb., February 7. A. W. Clark, Omaha, Neb.

The State Gas Convention will be held at Kalamazoo, Mich., February 19-20. J. J. Knight, Kalamazoo, Mich.

The City and Borough Superintendents' State Convention will be held at Johnstown, Pa., in February. J. M. Berkey, Johnstown, Pa.

Sixteenth Annual Convention of the National Brick Manufacturers' Association will assemble at Cleveland, O., February 10-15, 1902.

CURRENT NEWS AND PRACTICE AMONG THE CITIES

Pavements and Trees—Books Burned to Prevent Spread of Disease—Cities More Healthy Than Country—Municipal Kitchens—Portable Refuse Burner—More "Clean City Clubs"

COMPANY WILL PAVE STREET.—The Berwick, Pa., Borough Council has granted a franchise to the Columbia Montour Electric Railroad to lay tracks on the streets and use the T rail. The company is to macadamize the part of the road used by it and a few feet on each side of the track.

McKINLEY MEMORIAL.—The first memorial monument in this country that has been erected to the memory of our late President, William McKinley, was erected by the citizens of Tower and Soudan, Minn. It is made of iron and was constructed by the National Iron Works in Duluth. Governor Van Sant and other distinguished people attended the unveiling.

MORE "CLEAN CITY CLUBS."—The women of Salt Lake City have determined to follow the lead of Chicago and form "Clean City Clubs," and wage a campaign against filth. They will help to enforce the ordinances against throwing litter in the streets, etc., to replace the broken and missing street signs, to secure better janitor service in the schools and to work a reform in the matter of cleaner street cars.

CITY EMPLOYMENT BUREAU.—Duluth, Minn., is another city that has undertaken to supply her unemployed with positions free of cost at a municipal employment agency. It was established at the request of organized labor. The bureau will endeavor to furnish employment to all workingmen looking for jobs without cost to them, and in the future will do the same for women. The plan has worked well in Chicago for more than two years.

TAX ON TICKET SPECULATORS.—The Council of New York City has passed an ordinance providing for an increase of the license fees of ticket speculators from $25 to $300 and $150 for annual renewal. The speculators will have to wear a badge not smaller than a silver dollar, and the deceiving of a ticket buyer will be considered a misdemeanor. Organ grinders will have to pay a license of $2 a year and only 350 licenses will be issued in the greater city.

TO INVESTIGATE CONDUITS.—The president of the Merchants' Association of New York City has appointed a committee of five to investigate the whole subject of underground pipe galleries and to confer with the Rapid Transit Commission of the city, or other individuals or departments necessary, and report to the Board of Directors as to their recommendation on the whole matter. The gentlemen appointed on the committee are as follows: Messrs. C. M. Wicker, William E. Curtis, George B. Cornell, W. A. Marble, and William R. Corwine.

SCHOOLS FOR THE DEAF.—The Board of Education of Moline, Ill., will soon provide separate schools for deaf children. Rooms will be set aside in each of the schools as occasion demands and teachers competent to teach the methods of deaf and dumb instruction will be engaged. The deaf children will associate with the others in the school yards so that they will not feel that they are a class set off from the rest of the world by reason of their affliction. The classes will not be composed of more than five pupils each, as one teacher cannot handle a greater number than that to advantage.

PUT SNOW IN SEWER.—Commissioner Moreland, of the Department of Public Works of Detroit, Mich., recently tried an experiment in disposing of the snow and slush from the streets. Instead of having the snow carted away in wagons to the river at fifty cents a load, as has been done heretofore, the men were provided with wide scrapers with which they pushed the snow to the manholes of the large nine-foot sewer. A man was placed in the sewer at each hole and kept the snow from clogging. As the temperature of the water in the sewer was much higher than the air above, the snow melted quickly and was carried away.

PORTABLE REFUSE BURNER.—The health department of Galveston, Tex., is experimenting with a portable refuse burner. The burner is hitched behind a rubbish wagon and all matter that is readily burned is placed into this burner instead of into the cart. When the burner is filled, it is unhitched from the wagon and the rubbish set on fire at once. It is expected that the burner will do all that a crematory would perform except incinerate heavy materials and liquids. As a good crematory costs at least $5,000 and these burners $100, considerable saving can be made in the disposal of rubbish, in the opinion of the authorities.

"DOCTORED" MILK.—The State of Washington has just secured the conviction of three Spokane milkmen who were accused of selling milk that had been treated with the preservative called formaldehyd. They were fined $25 and costs for each offense, the minimum penalty as it was their first offense, but it is hoped by the authorities that these convictions will have the wholesome effect of deterring others from violating the law. The health officers of Los Angeles, Cal., have been active in exposing dealers that water or adulterate their milk, and have been warned that a second offense will necessitate their withdrawal from business in the city.

NEW MODEL CITY.—About thirty-eight miles from Pittsburg is the town of Vandergrift, the creation of the American Sheet Steel Company. All the streets were sewered, piped and connections made with the house lots before the vitrified brick pavement was laid. The streets are wide, form arcs of circles, and much shrubbery and flowers have been planted along them. Lots are sold at the same prices as in the nearby towns, but no liquor is to be sold. Ground has been given for four churches, which must cost at least $15,000 each, the company giving one-half. A $14,000 casino is to be erected for public assemblages, a library of 2,500 volumes to be housed there also. The town is self-governed, the company furnishing the water, gas and electric lights.

WASTE PAPER BOXES.—The Board of Control of Hamilton, O., has granted to a concern a franchise to place waste paper boxes about the streets of the city. The boxes will be well-shaped metal receptacles in which pedestrians can throw papers and rubbish that would otherwise litter up the street. An ordinance will compel the disposal of waste matter in them and also protect the boxes from injury. The boxes will be about five feet high and rest on legs nine inches in length, so that no dirt will accumulate under them. The top of the boxes will be shaped like a gable roof, and at one side will be a swing door through which the litter is to be thrown. The shape of the boxes will permit of four advertisements being placed on the body, and it is from this that the concern making them hopes to realize enough to pay for the installation. The city of Chicago has in use about 1,200 of these boxes.

WORKING TO BEAUTIFY CITIES.—The American Park and Out-Door Art Association has succeeded in having passed an ordinance in the city of Quincy, Mass., imposing a fine for placing advertising matter on poles, posts, trees, etc. A bill has been introduced into the House of Representatives of the Illinois Legislature containing practically the same restrictions as regards advertising notices on any building, post, fence, bridge, etc., belonging to the State and county or township. No advertisement shall be placed on any other building, post, fence, etc., without the written consent of the owner and occupant of the building. In addition to these matters, the association has addressed a letter to various railroads suggesting that the unsightly buildings and sheds can be hid from sight, in time, by the planting of shrubs and trees about them, and that the stations can be made very attractive by flowers and shrubs at little expense. The roads are asked to agree to carry forward the work of beautifying their stations and grounds.

PUBLIC BATH AT ALBANY.—The public bath at Albany, which has recently been opened, will afford everything in the way of service that a public bath can give. The hours are so arranged that on some days the baths are free, while on others a small fee of ten cents is charged, making the bathing a trifle more exclusive. Instruction is given in swimming to classes of not more than eight persons, the rates for which amount to about 75 cents per person a lesson, or a twelve lesson course for $6. Bathing suits and towels are provided free by the institution, but a fee of $1 will secure for a year a locker in which can be kept one's own suit and towels. These will be washed and dried and returned to the locker after being used. Strict rules are enforced in regard to the conduct of the bathers, and many suggestions given as to the best time to bathe and what to do in order to get the best effects of the bath.

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SCHOOLS IN GOOD CONDITION.—The eighth annual report of the schools of the city of Columbia, S. C., for 1900-1, shows that the schools of that city are in a flourishing condition. Last year the schools were run at a cost of tuition of only ninety-three cents a pupil per month and the average salary paid the teachers was $42.75. For the first time in recent years more white than colored children were enrolled, being 1,374 white and 1,255 colored. Of all the pupils, 93.15 per cent. were below the high school, 75.08 of these being below the fifth grade. The increase in attendance has been steadily growing and the accommodations must be enlarged to meet the needs of this increase. Since 1897 the annual deficit in the finances has been turned to a growing surplus. The receipts have increased 61 per cent. and the expenditures only 31 per cent. since 1890, but it is the purpose of the authorities to so use this surplus that increased accommodations will be added for the use of the steadily growing population.

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CITIES MORE HEALTHY THAN THE COUNTRY.—The census statistics that have been recently published by the government have revealed the surprising fact that the death rates of cities are relatively less than those for the country. The proportion of deaths to population has decreased 10 per cent. in the last decade and the improvement is confined almost entirely to the cities. This can be traced to the improved methods of sanitation observed in all the progressive cities, but almost ignored in the rural districts. The deaths from consumption form a good example of this attention to health. In 1899 there were 245 persons per 10,000 inhabitants afflicted with this disease, but in 1900 this was reduced to 190. Deaths from cholera, typhoid fever, diphtheria, etc., were reduced to a remarkable degree, but fatal cases of pneumonia increased from 189.9 per 10,000 in 1890 to 191.9 in 1900, being due to the epidemics of "grip" and influenza. Cancer, kidney and heart troubles also increased. The decreased number of deaths from consumption has had the most to do with the increased length of life of the average American, which has risen from thirty-one and one-tenth years in 1890 to thirty-eight and two-tenths years in 1900.

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MUNICIPAL KITCHENS.—The city of Nantes, France, has evolved an inexpensive method for supplying food to the destitute. For several years the city has maintained kitchens where persons without money may present tickets and procure a warm meal. A dormitory has been added to one of the buildings where about fifty people can be accommodated. For three nights these beds are free to the same persons, when they must make way for others. During the stay at the dormitory each one is given two meal tickets a day. The kitchens themselves are only open from October 15th to April 15th each year, but the dormitory is open all the year round. Tickets entitling the holder to anything on the bill of fare are placed in the bakeries and tobacco shops throughout the city, where they can be purchased by charitably inclined persons to be handed to the applicants for aid. Meats, fish and eggs on the bill of fare cost two cents a plate. Beans, rice, etc., are one cent. The expense of these kitchens has been growing less each year. The total expense for last year was about $9,264, and the receipts $7,720. The privilege of taking meals at these kitchens is not restricted to the destitute, but many workmen take their meals there on account of the moderate prices. A moderately substantial meal can be obtained for five cents.

♣

PAVEMENT AND TREES.—It is claimed by those who have had experience in the planting of trees in streets paved with asphalt, or other impervious material, that the life or death of the trees depends upon the nature of the subsoil. If there is a substratum of rock, the trees are sure to die, as the pavement will prevent moisture from reaching the roots from above and water cannot soak in from the surrounding land. If, however, there is a deep soil, the pavement acts as a benefit to the growth as it prevents the moisture from evaporating, while the water is supplied from other parts. Many times the death of trees is owing to the fact that when the pavement or sidewalk is laid, the excavators for the foundation cut off the roots of the trees and thus deprive them of their means of securing nourishment. It has been suggested that trees should not be planted along the edge of the walks near the street, but on the side next to the property line. In support of this it is pointed out that, when planted in the usual way, horses are able to gnaw off the bark, wagons are backed against them, water cannot reach their roots, and, if they are able to grow large, the whole street is covered with the branches, interfering with traffic and sunlight. Planted about two feet from the property line, all these objections would be removed.

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COMPANIES SHOULD PREVENT ELECTROLYSIS.—On the occasion of his installation as chairman of the Manchester (Eng.) Section of the Institution of Electrical Engineers, Mr. C. H. Wordingham, M. Inst. C. E., referred to the rules and conditions that have been laid down by the Board of Trade of Manchester in regard to the electrolysis of underground conductors. He stated that the gas and water companies have sought to impose conditions impossible for electrical engineers to carry out, while on the other hand electrical engineers have repudiated responsibility altogether. He asked if the electric companies had any right to so conduct their business that other companies, which have the same right to the streets as they, should have their property destroyed. The only reasonable position is that the electric traction companies, which do most of the damage by electrolysis, should be allowed to carry out their work in the manner sanctioned by the Board of Trade, but if it can be proved that damage has been done by them they should pay the cost. The proof of such damage rests on the gas and water companies, but the disastrous effect that would arise from a wholesale destruction of pipes seems to have been lost sight of. Those that hold that there is no danger are urging on the traction companies to what will prove their ruin, but those that now point out the danger are the real benefactors to the profession.

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LIBRARY BOOKS BURNED.—One of the most common means of spreading contagious diseases has been through the medium of library books, and the library of Milwaukee, Wis., has adopted drastic measures to minimize the danger. Here no attempt is made to fumigate the books that are returned from houses in which are contagious diseases, but the books are immediately burned. As soon as a contagious disease is reported to the health department, the library officials are notified by a card giving the name and address of the patient. These cards are compared with the names on the list of the circulating department and a little "guard" is placed on the card containing the name of the afflicted person. This "guard" is a slip of paper containing the name and address furnished by the health department and the name of the disease. When the borrower comes back with the book from the house in which was the disease, his card is retained until the library is notified by the health department that he has complied with all the rules of disinfection. The book is taken to the head librarian and by her consigned to the flames at once. It would seem that this was a very expensive way of preventing contagion, because so many valuable books have to be burned, but it is stated by those in charge that all the books that have been burned were volumes that had seen a great deal of service, and that what really valuable books are occasionally burned are not worth the danger of contagion that would threaten the people if they were not so treated.

ORNAMENTAL PARK BRIDGE

BY H. G. TYRRELL, C. E.*

THE accompanying photograph illustrates the electric lighting of a park bridge, recently built at Madison, N. J. It serves the double purpose of a foot-bridge and a park ornament. The eight electric lamps, four at each end, mounted at the top of ornamental standards, serve to add grace and prominence to the bridge, both by day and night.

It spans two tracks of railway where they cross the park in a cutting.

The center part of the bridge is steel plate girder, built in the form of an arch. It has a clear span of 50 feet, and a width of 10

MUNICIPAL ART AS APPLIED TO PARK BRIDGES

feet. The two girders are connected at the bottom with light beams, and between these are laid curved sheets of corrugated iron, which carry the concrete and pavement.

The girders are held in a vertical position by gusset plates riveted to stiffeners on the web, and fastened to the floor beams. Beneath the floor are cross braces in the plane of the bottom chord, and at each end there is a vertical cross frame. The girders are capped with heavy cast iron hand rails.

On the outside of each girder there is built a projecting fascia, representing an elliptical arch, thin at the crown and increasing in thickness towards the abutments. These are built of ornamental stone work, and on top of the stone newel posts are set the electric lamps.

The whole structure is surrounded with plants and shrubs, and presents altogether a pleasing appearance.

INDEX FOR CITY ENGINEERS

MR. GEORGE H. MARR, in a paper read before the American Society of Mechanical Engineers, told of a method he had worked out by which he could file and index quickly all notes, data, etc., that he wished to keep. The notes and clippings are arranged in a document file, which is made of strong manila envelopes, six and one-half inches wide by ten inches long, open at the end, with a flap and a binding strip to secure one edge, so that the open end is at the top of the book when bound. The front side of the envelope is ruled so that there are spaces in which to write the subject, authority and issue of each item. The name of the article is written under "subject," the author's name under "authority," and the abbreviation of the publication under the "issue." If the information is from a book which it is not desired to mutilate, the page number and name of book can be placed in the last column.

When it is known that there will be a large number of references on a subject, a leaf ruled on both sides, with rulings the same as on the envelopes, is inserted in the file, next to the envelope containing clippings on the same subject. In the upper right-hand corner is written the first three letters of the subject which the envelope contains, and if it is liable to contain a number of clippings on the same subject the first three letters of the subject are marked in the corner, and the full subject written across the top of the envelope. Thus, for example, an envelope on "Steam Engines" bears on the corner the guide letters, "Eng.," and across the top the subject, "Steam Engines." The next envelope would have the same guide letters, but would have across the top, "Gas Engines," and so on. In case there is an article printed on both sides of a leaf, but on different subjects both of which it is desired to preserve, the clipping is filed under the subject which will be likely to be referred to most frequently, and the other subject is entered on its proper envelope; but in the column headed "Issue" a reference is made to the back of the subject first filed.

If an article is particularly good, the word "good" can be marked on the envelope. The number of words in the article, or if it is a cut and a description of some device or an advertisement, all can be indicated in a similar way. By making these short notes in regard to an article when it is filed, when later on it is looked up, it enables one to determine which is the clipping most likely to furnish him with the desired information.

If all notes are taken in one of the many note books that have detachable leaves, when the book is filled, the matter least liable to be used in everyday affairs is detached and filed away in the above envelopes after the manner of the clippings.

OHIO LEAGUE OF MUNICIPALITIES

THE Ohio League of Municipalities will convene for its fifth annual session in the city of Columbus, February 4th to 6th, inclusive. This organization was the first State league of its kind. Its annual sessions are always interesting and contribute valuable matter for the consideration of municipal officers. The approaching session is of more than ordinary importance because it is held during the session of the Ohio State Legislature, which is to consider a bill which contemplates the thorough revision of the municipal code of that State.

There is no State in the Union where there is greater need of a revision of the municipal code than Ohio. The present code is about as mixed up an affair as it could be. Special charters have been created for almost every city of whatever class, grade or size, no two being governed alike, with the possible exception of Youngstown and Akron. There are several charters which violate well-known principles of municipal government in mixing executive and legislative authority with certain administrative offices.

This chaotic state of affairs has existed for several years and has been one of the things which the league has endeavored to improve. One object of holding this session in Columbus is to provide an opportunity for a general public discussion of the whole question with the purpose in view of influencing, if possible, the action of the Legislature in session. The officers of the league, Jesse R. Lindemuth, president, Mayor of Dayton; Samuel J. Swartz, vice-president, ex-Mayor of Columbus; J. L. Orbison, treasurer, ex-Mayor of Carthage, and Dr. S. O. Giffin, secretary, ex-Alderman of Columbus, are all enthusiastically interested in revising the municipal code for the State of Ohio. These officers, together with the State Board of Trade and other organizations, have been agitating the subject for several months. A model code has been submitted for consideration, it being the product of a commission consisting of Judges Kibbler, of Newark, and Pugh, of Columbus, O. Some of the provisions of the proposed code are ideal in character, but it is hoped that at least a compromise may be effected with opposing elements, and that out of the whole there may come a much clearer and cleaner code for the governing of Ohio cities.

The programme for this session, which has been arranged up to date of our going to press, is as follows:

"Electrolysis of Water and Gas Pipes Resulting from Electrical Current Escaping from Street Railways," by E. T. Matthews, Esq., City Solicitor of Dayton, O.

"Sewers Limited to Cities of from 6,000 to 15,000 Inhabitants," by W. D. Brumbaugh, Esq., Greenville, O.

"The Need of a Law Authorizing Cities to Appropriate Money from the General Expense Fund for Membership Fees and Sending

* Boston.

Representatives to Municipal Leagues," by Mr. Allen Ripley Foote, Editor of *Public Policy,* Chicago, Ill.

"Some Irregularities in Municipal Taxation," by Jason Blackford, Esq., Findlay, O.

"The Best Methods of Municipal Taxation," by Mr. Lawson Purdy, of New York.

"The Revised Code Bill and Modern Municipal Government," by Judge Aaron A. Ferris, Cincinnati, O.

"Municipal Taxation," by Tom L. Johnson, Mayor of Cleveland.

"The Bill Board Nuisance; Should It Be Regulated?" by Mr. William S. Crandall, of New York.

THE ASPHALT TRUST APPLIES FOR RECEIVERSHIP

THE so-called Asphalt Trust has voluntarily gone into the hands of a receiver. Those who have feared the operations of this trust and its strong opponents will breathe easier now that the chief cause of their fear has come to grief. It appears, however, upon investigation, that the action was precipitated by those who are friendly to the Trust's interests, in order to prevent similar action by those less friendly. When the matter came up for consideration before a Federal Judge in New Jersey, upon allegations, which were acknowledged to be true, the trust was found bankrupt, and three receivers were appointed for the two companies which form the essential features of the trust; two, at least, of the receivers are identified with the trust interests.

To understand the situation it is necessary to recall some of the past events. A year or so ago the Asphalt Company of America, which was formed in 1899, had a practical monopoly of the paving business of the country, through the purchase of the Barber Asphalt Company and other lesser concerns. The price paid was $30,000,000 of "gold certificates" or bonds, after which it issued stock to the same amount. Some of the company's representatives stated as a fact, about a year and a half ago, that only $6,000,000 of its $30,000,000 of stock was paid in at that time. The company's supposed monopoly was its chief asset. In June, 1900, the National Asphalt Company was formed in Philadelphia, which absorbed several comparatively small properties. It competed in New York, with the New York concern, which was supposed to have a monopoly, and secured the contract for paving Broadway between Union Square and 42d street.

Shortly after this event a new "trust" was formed, and the Asphalt Company of America, of New York, announced that it had been consolidated with the National Asphalt Company, a case of "the tail wagging the dog.'

The new company was dominated by the Philadelphia end, and the policy of the old concern radically changed. In the operation of the subsidiary companies the men who had made the working companies successful were released, one after the other. The successful manufacture of the paving material had been largely a secret within the leading companies doing the business, and in that lay one element of the trust's strength. But when the men were released who knew this secret and how to operate it successfully were allowed to go, the situation began to change. Then when the claim that the trust had a monopoly of workable asphalt—or even a monopoly of Trinidad asphalt—proved to be baseless, and when the Warner-Quinlan Company, of Syracuse; the Federal Asphalt Company, of Chicago, and other smaller companies not included in the trust, strengthened their attacks on the trust by utilizing the very men who were released by the trust, the whole structure of the Asphalt Trust was undermined and began to crumble. The present outcome is not altogether in the nature of a surprise, therefore, to those who had any knowledge of the true situation.

When the National Asphalt Company a year ago this fall absorbed the Asphalt Company of America, it did so with a capital of $22,000,000, divided into 200,000 shares of 6 per cent. cumulative preferred stock, of a par value of $50 each, and 240,000 shares of common stock of the same par value, issuing besides this $6,000,000 of 5 per cent. fifty-year gold certificates. At that time Asphalt Company of America securities were quote at 98. Last month National Asphalt was quoted, at Philadelphia, where Asphalt stocks are dealt in, at ½ bid, ¾ asked. On the same day in the same market the 5 per cent. gold certificates of the National Asphalt Company were quoted at 14⅛ bid. The asking price was 15—three years' interest. The 5s had gone down from 20 within three weeks. This was the situation a little more than a year after the $22,000,000 tail, built to wag the $60,000,000 dog, had begun the wagging, when the owners of the installment-built animal took their case to court in New Jersey.

This is the beginning of the end of another asphalt bubble. No doubt this company will reorganize, or some other company will take the lead, and another attempt will be made to form a trust, but the result is more than likely to prove as disastrous. Current events are verifying the assertion of Secretary of the Treasury Gage, made soon after the trust question became an issue: "I have greater fears that those who invest their money in trust companies will lose than that the general public will suffer by the operations of these combinations of capital." The outcome of this downfall of the Asphalt Trust will work advantageously to not only those companies which have been waging war against it, but also to American cities.

THE ADVENT OF THE AUTOMOBILE STAGE

SLOWLY, but surely, the automobile is ousting the horse from its kingdom, and, in the cause of humanity as well as of progress, the change is to be greatly desired. And now the automobile stage has made its appearance on Fifth avenue to take the place of the old line.

Since the introduction of smooth pavements the life of the horse has been made miserable in wet or snowy weather. It is indeed pitiable to see the way in which they strain to keep their feet when there is a coating of ice on the street. Often where there is a grade, and not infrequently on the level, it has been impossible for the horses to draw their loads. There have been many instances in New York where the horses have been taken off wagons on this account. It is

ELECTRIC AUTOMOBILE, FIFTH AVENUE STAGE LINE *

true that it is easier for horses to drag a certain load over a smooth pavement than over one of the old kind, but in proportion as the surface of the road has become smoother the loads have been increased and the horses have not gained much in the bargain. However, smooth streets have come to stay, and the only objection that can be raised against them is this matter of slipperiness in wet weather. To the automobile this matter of smooth pavements is a benefit instead of a hindrance, and an ice-covered hill presents no difficulties to an electric vehicle that is not easily surmounted.

The condition of the streets ever since the wholesale introduction of self-propelled vehicles and street cars has been infinitely better as regards their cleanliness, and the further retirement of the horse from the public ways cannot but materially aid in increasing the health of cities.

The accompanying illustration shows one of the electric stages that are replacing the old horse-drawn vehicles on Fifth avenue, New York City. These stages will furnish a luxurious means of traveling, as they are handsomely equipped, and, while much heavier than the old horse stages, travel much more quickly and easily.

* Courtesy of *The Electrical World.*

HOW TO REGULATE THE LEVEL OF PARK LAKES

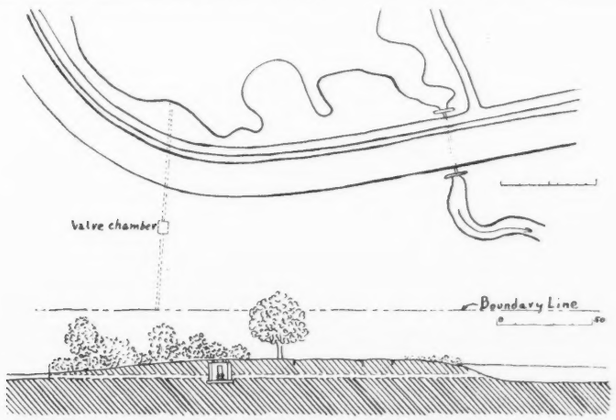
By R. N. Clark *

THE accompanying illustration shows a combined valve or gate-chamber and storm water overflow which was designed by the writer to meet peculiar conditions confronting us (1st) in taking care of the surplus water from our proposed lake in Goodwin Park, (2nd) in providing the means for draining the lake when necessary, and (3rd) for maintaining at different seasons of the year different elevations of the water surface.

The structure itself consists of a brick vault, or chamber, divided into two nearly equal parts by a weir. One of these chambers (the one on the left in the illustration) is the receiving well, and in it the water stands on a level with that in the lake, except when the latter is being drained. This part has double brick walls of twelve inches in thickness separated by a two-inch layer of Portland cement mortar composed of one part by measure of American Portland cement to one part of clean sharp sand.

The other part is the gate chamber proper, and contains the two sixteen-inch valves, the use of which is described further on. This chamber his twelve-inch walls on two sides, while the end is an eighteen-inch wall for about one-half the height with a twelve-inch wall the remainder.

Each chamber has for a floor a blue-stone flag four inches thick in order to prevent wash of the concrete foundation, and digging into the same when cleaning out sediment. The structure was covered



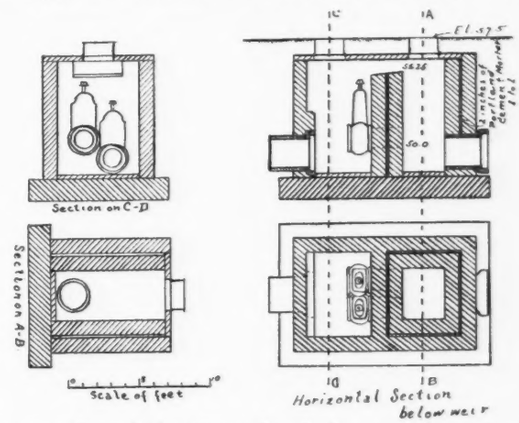
VALVE-CHAMBER GOODWIN PARK

with two similar pieces of flagging in which were cut holes for entrance, and smaller ones for the insertion of keys for opening and closing the valves.

The walls were plastered on the inside with a layer of Portland cement mortar one-quarter of an inch in thickness.

The entire structure rests on a foundation of Portland cement concrete eighteen inches thick, consisting of one part cement, three parts sand, and five parts broken stone, extending twelve inches beyond the brick walls on every side.

In the summer season it is intended to maintain the surface elevation of the lake as near 55.0 as possible; hence the skim overflow, which is through a twenty-four-inch pipe culvert under the walk and drive (as will be seen on the left of the sketch plan), is placed at 54.5. This is accomplished by means of another weir placed a short distance above the entrance to the culvert, which latter is so placed that in times of freshet the twenty-four-inch culvert pipe will be running full before the water in the chamber rises to the bottom of the cover stones, which is about 56.5. Whenever the water rises to 55.25, however, it begins to flow over the weir between the chambers, in which the area of opening is considerably larger than that of the twenty-four-inch pipe which forms the entrance to the chamber. From here



it runs away through the twenty-four-inch waste pipe, and spills out in the bed of a small water-course which was the original outlet of the vicinity.

In winter it is intended to lower the water in the lake five feet to elevation 50.0, in order to provide safe skating. In order to maintain this level, a sixteen-inch iron pipe was built into the wall below the weir and provided with a valve. In the fall before very cold weather, this valve is to be opened and the water in the lake will then drop to the required level, the valve, of course, being left open till spring.

In order to drain the lake, when necessary, for the removal of undesirable growth, or for other purposes, a second sixteen-inch pipe with valve was built into the wall, but at a level with the bottom of the twenty-four-inch inlet pipe. The mode of operation is obvious. Unfortunately the very slight grade of the bed of the brook beyond the park boundary made impracticable the placing of the entire arrangement low enough to drain the lake to the bottom; and, as it is desired to have a maximum depth of eight feet, there will always be two feet of water at the bottom which will not drain away. It is improbable, however, that it will ever be necessary to completely empty the lake.

Not the least of the advantages of this arrangement over the ordinary one of bulk-head and flash-boards, is the entire absence of any unsightly features, the whole being below ground, nearly 200 feet from the shore of the lake, and on the opposite side of the drive where even the covers of the manholes can be planted out and thus screened from view if desired.

The pipe used was a twenty-four-inch Akron tile in three foot lengths. The manhole frames are cast iron, of the ordinary type.

* Engineer of Public Parks, Hartford, Conn.

RAISED LABORERS' PAY.—The City Council of Montreal, Can., passed a resolution raising the pay of laborers from $1.25 to $1.50 per day. This law will apply to labor employed by contractors doing city work as well as to labor hired directly by the city.

ANALYSIS OF FINDLAY'S WATER.—An analysis of the river water at Findlay, O., which was so much polluted by salt that it was rendered unfit for use, has been made by the Pittsburg Filter Manufacturing Company, of Pittsburg. Mr. F. T. Aschman, the chemist, has reported that the water contains the following matter in grains per gallon: Sodium chloride, 89.46; calcium sulphate, 41.63; calcium chloride, 7.69; magnesium chloride, 144.24; aluminum oxide, 3.23; silica, .53; organic matter, 19.75; total solids, 306.56.

A BOULEVARD CLUB.—In the city of Honolulu, H. I., there has been formed an association for the purpose of building a boulevard from the city proper to the parks on the outskirts. At least 2,000 persons will be secured who will pledge themselves to pay $1 a month for twenty-five months, thus raising $50,000 towards the construction of the speedway. It is to be four miles long, 100 feet wide, with a twenty-foot bicycle path in the centre, flanked on either side by rows of poincianas, a beautiful tropical tree. There will be two roadways for driving, thirty feet wide, on each side of the bicycle path, and two ten-foot walks for pedestrians lined with rows of palms. The surface of the road will be asphalt rock. If the project can be put through it is hoped that a memorial to McKinley, maybe an arch, will be located at the entrance.

THE BEST FIRE DEPARTMENT ON THE CONTINENT

The First Steam Engine Used, in 1832—Well Organized Ambulance Service—Liberal Provisions for the Men—Firemen Thoroughly Drilled

By Our Special Correspondent

WHILE the fire department of Berlin, Germany, has had an existence of but fifty years, its great strides in development have placed it in the first rank. The department has been organized not only for the extinction of fires, but also for their prevention. It is due, in a great measure, to the latter work that the city does not need to rely on a large department for fire protection. In addition, the Berlin department has served as a model to the other cities of Germany and of the Continent. It has been a school in which the chiefs of many of the other German fire departments have learned their trade. Most of them have been subordinate officers in the Berlin department before being called to take charge of high places in other cities.

GRANDDIRECTOR GIERSBERG, BERLIN FIRE BRIGADE

THE FIRST STEAM FIRE EFGINE USED

The first steam fire engine on the Continent was employed in Berlin. It was built in London and was known as the "Comet," going into service in the German capital in 1832. While Berlin had a fire department for many years previous to the present one, it was not until 1851 that the modern department came into existence. It was at that time that the old methods gave way to modern ideas; new apparatus was purchased, new engine houses built and a fine system of training for the men introduced. Theretofore the men had been simply machines, doing just what they were told and even that unintelligently. Since that date the men have been trained to be real firemen, although the old idea of doing nothing without the order of an officer still crops out at times. The man who brought the department up to something like its present condition was Scabell. He was the organizer and first chief of the department and was known as the "Branddirector." Since his time there have been but four chiefs. The present chief, Giersburg, went into office in 1893. He is an army officer, an energetic and progressive man, who is ever ready to try a new invention for preventing fires or extinguishing them and who can be persuaded of the good points of such if he honestly believes them to be good.

In ultra-military Germany it is a surprising fact that the fire department should be under the police and not in the control of the army. Such, however, is the case. There are in the department 890 men, 130 horses, and 118 engines and other apparatus. Of these 890 men, 825 are firemen, thirty-three are telegraph operators, thirteen clerks and nineteen leaders and company commanders besides the Branddirector. The cost of the department is about $415,403 a year, making a per capita charge of about $.216. The city of London spends $1,401,420 in the maintenance of its department and New York over $5,000,000.

LIBERAL PROVISIONS FOR THE MEN

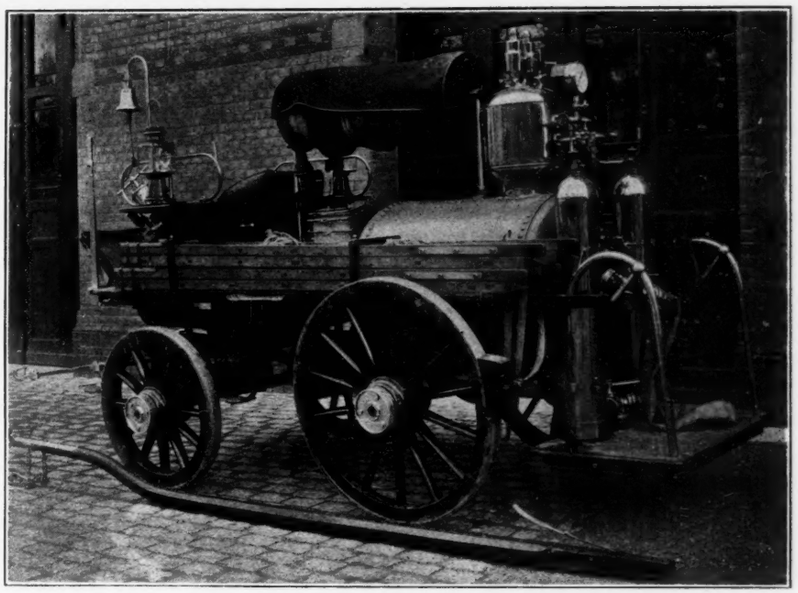
The German engine houses are usually roomier than those in American cities and more apparatus is on the floor. The men are always in uniform and the horses are harnessed and in their stalls facing the apparatus. It takes about one minute to be out of the house after the alarm comes in. This is much longer than is necessary in fire departments on this side of the Atlantic, but it is in accord with the quietness and order that characterizes all operations of the Berlin fire department. The apparent slowness and lack of enthusiasm that manifests itself during the fighting of a fire in the German city is a surprise to the American visitor but there is less danger of the men losing their heads, and, then, too, the houses in Berlin do not burn up so rapidly as they do in America. A fireman on a bicycle precedes the apparatus, which in itself makes little noise on the streets by bell or whistle. The apparatus is very light and on most pieces is a strip of board about two feet high directly behind the driver and from this extends a white signal. By this signal the man who sits beside the driver indicates the direction to be followed by the engine or tender. If the direction is straight ahead it is held

FIREMAN SENTRY BEFORE BERLIN FIRE HEADQUARTERS

EMPRESS REVIEWING BERLIN FIRE BRIGADE

stationary, if to the right or left the signal is waved toward that direction. Of the smaller apparatus in Berlin they make extensive use of the hook ladder. A single fireman carries one of these ladders and the men are so well trained that they can soon climb up the side of a house by hooking their ladder on a window sill, drawing themselves, raising the ladder to the next sill above, climbing up to that and so on.

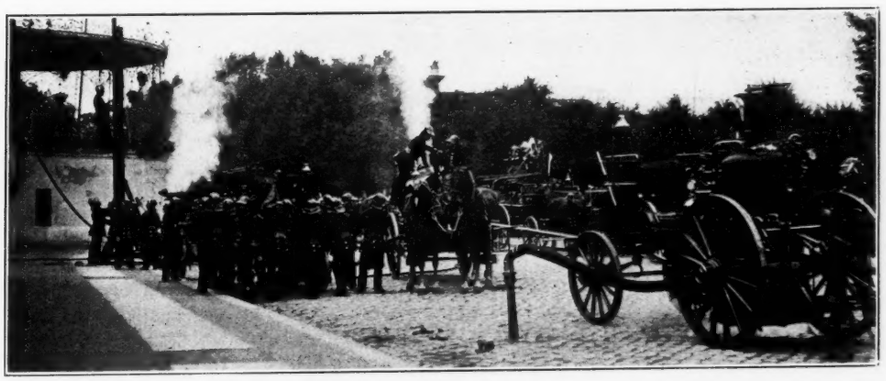
In the Berlin department the ambulance service plays a very useful part, both in the time of fires and during intervals between them. A large portion of the men in every German fire company are practiced in "first aid to the injured" and wear a red cross on their sleeve. On all the apparatus are carried bandages, etc., that they may be handy in the time of need. Thus it is not necessary for an injured person to have to wait until a doctor can be summoned, for the firemen can do much toward relieving their injuries. Not only are these firemen on duty as physicians at a fire, but, if any one is hurt on the street and he can reach a fire house, he does so, as there relief is given him temporarily. If the firemen are told of an accident they always go to the assistance of the injured at once.



ONE OF BERLIN'S CHEMICAL ENGINES

FIREMEN ARE WELL DRILLED

The firemen themselves are well drilled and receive lots of athletic training in their quarters. The drills they give show their ability in gymnastic work and feats of strength. In handling the apparatus they are very proficient and can raise their ladders against walls and be at the top in short order. One of the accompanying cuts shows the sentry that is on duty before fire headquarters. He paces up and down with the axe over his shoulder and with a leather helmet on his head. His uniform is dark and has no light colors in it to relieve its somberness. There have been several instances of over-discipline in which loss of life has occurred because the men would not do anything until the arrival of an officer. While at most times this strict obedience to rules is an excellent thing, there are instances in which the men should be permitted to act on their own initiative. This is one of the reasons that the American firemen are such good fire fighters, because they can use their own brains and do not have to think through the brain of some one else. If any one sends in an alarm in the city of Berlin and a policeman detects him in the act, he is detained until his name and address are taken, the place of the fire and the connection the man has with the house in which the fire is. It is very hard for a man to have to wait and be questioned while his family are in danger, but the rules are inexorable and all must submit to them. It is not often that false alarms are sent in for the fun of it in that city. Another unusual thing is that, after the fire, the firemen set to work to clean up the place, scrubbing the floor and walls and carting away the burned debris. Then comes the inspector who determines the cause and the responsibility of the fire. The owner of the house is summoned to headquarters and, if the fire has been caused by some defect that he is responsible for he is made to pay for repairs and for the expense of bringing out the engines. If the present owner is not responsible, but the former builder, that man, no matter how long ago he may have sold the house, is summoned and made to pay the loss.



BERLIN EXHIBITION—A HITCH, RUN AND CONNECTION AGAINST TIME

SEPARATE CONDUITS FOR HIGH AND LOW ELECTRIC CURRENTS

In a paper read before the International Association of Electrical Engineers at Niagara Falls, N. Y., in September, Captain William Brophy of Boston, Mass., presented his ideas on the "Inadvisability of Placing High and Low Potential Wires Through the Same Conduits or Through the Same Manholes." After reviewing the question of placing all wires under ground and the various methods that have been employed by companies doing so, he takes up the important matter that is now occupying the attention of the public and electric companies as to the best methods of accomplishing this much needed reform.

He says that there are but three plans to be considered: (1) To grant permission to each company to construct and maintain conduits under such reasonable restrictions as are necessary for the interest and protection of the public; (2) To grant such permission to a private company to build the conduits, to be rented at a figure that will ensure a fair return on the investment; (3) Municipal ownership, the city constructing and maintaining the conduits at a rental sufficient to pay the interest on bonds and meet the requirements for a sinking fund for the final redemption of the same. The first has been adopted by Chicago and Boston and many smaller cities. In Philadelphia the first two plans have been adopted.

In regard to the first plan of private ownership of the conduits, Captain Brophy claims that they are giving perfect satisfaction to all people not wedded to the other two methods. These people claim that the space under the surface of the streets should not be given up without adequate money consideration, or that the city should own the conduits. The advantages of the first plan are that the work, being done under supervision of the city, is done in a substantial and workmanlike manner, and is not likely to give any trouble for many years to come. In Boston the plans must be approved by the

city and the work and material inspected at every stage. A standard of insulation is established and maintained for all high-tension conduits, and the poles that are considered such a menace to safety are removed. The many accidents that occur when high and low potential wires are placed on the same poles and the interruptions caused by the snow and wind are all avoided by the conduits. When owned by the private companies the city is relieved of all responsibility for the conduits and what they contain.

It is objected to the plan of private ownership of conduits that a valuable privilege is given to the companies by the cities for which nothing is received in return. The author contends that such is not the case, for they pay a tax in some form or other on their overhead or underground systems, and in addition they reserve space on their poles for municipal wires or one or two ducts under ground for the same. In Massachusetts the overhead wires and underground systems of electric light, power and street railway companies are taxed as personal property by the cities and towns. The lines of the telegraph companies are taxed by the State, based on the mileage. The telephone company pays a franchise tax to the State based on the number of telephones in use in other New England States in which it does business in proportion to the number of 'phones in use in Massachusetts.

In answer to the claim that a special tax should be paid by those occupying the public streets with overhead and underground wires, it may be said that the owners of public conveyances and private carriages pay no special tax for the use of the streets. Water, gas and electricity have become a necessity to the people and cannot be dispensed with, and water and gas have but one place where they can be placed, and that is under the street. To impose a special tax on electric wires under ground, a public improvement over having them on poles, seems unfair and beyond the bounds of reason.

Municipal ownership, which has taken such a firm hold on the minds of people in some parts of the country, is nothing but a craze, says Captain Brophy, and the country is strewn with municipal ventures that have failed. Assuming, however, that municipal ownership is decided upon, difficulties arise that are hard to overcome. The companies owning low-tension wires object strongly to this joint occupancy, and the Captain considers their objections good and sufficient. Thus the absolute control of wires and cables cannot be maintained by their owners nor can there be assured perfect safety from injury due to the carelessness of those not in their employ and whom they cannot control. There is the difficulty of one company's men occupying the manholes when another company wishes to work there, and long delays will thus be caused. Then, too, there is no external difference between lead-covered cables for high and low-potential currents, and a workman is very apt to cut into a cable not belonging to his company with results damaging both to the man and the other cables in the vicinity. Economy and the desire to obtain the greatest revenue possible are the only excuses for building underground conduits for joint occupancy, but this consideration should not weigh for a moment against the danger to the public. In the first Chicago conduits the arc light and police and fire department wires were placed in the same conduit, but the turnouts were so frequent that the latter had to be removed.

It is the duty of those who have charge of the fire and police department wires to resist every attempt to place wires that are termed the "nervous system" of those departments, in the same manholes with any but low-tension wires. It is the duty of those that have under their control the municipal inspection of electrical construction and material to stand between the public and those who would thus add to the dangers of powerful electric currents in the streets.

In conclusion Captain Brophy said that the only system to be followed is the one adopted by Massachusetts and the city of Boston. By this system space is given the companies to construct conduits under direction of the city authorities. Each company is responsible for its own conduit, and, when accidents happen, the responsibility is not divided. Low potential wires are protected from the ones carrying powerful currents and safety to life and better service are secured.

EXPERIMENTS WITH SULPHUR DIOXID AS AN INSECTICIDE

THE work that had been done by Mr. M. J. Rosenau, Director of the U. S. Hygienic Laboratory, in experimenting with formaldehyd gas as an insecticide, especially as adapted to the killing of mosquitoes, was told in the December issue. Further experiments were carried on by Mr. Rosenau with sulphur dioxid, the results of which were given in the second portion of Bulletin 6.

Experiments were made with burning sulphur and the liquid sulphur dioxid gas. This gas is well known as a destructive agent to all animal life and, on account of its injurious action on fabrics and metals, it is of little use for house disinfection. The destructive action is due to the moisture that combines with the sulphur dioxid to form sulphurous acid, the real disinfecting agent. The dry gas has practically no effect on bacterial life. The experiments that were undertaken proved that small quantities of the dry gas would destroy mosquitoes and so the destruction of the insects can be done in the house without much damage to household effects. The gas in the liquid form seems the best for the purpose as there is no danger of setting fire to the house as when sulphur is burned.

The first experiment consisted in burning two pounds of sulphur in a small room with a capacity of 500 cubic feet. Thus about 4 per cent. of gas was given. The room was nearly air-tight and the time of exposure was four hours. Mosquitoes were exposed in small pill-boxes with gauze lids placed under towels, newspapers, wrapped in towels or placed in pockets of coats, etc., so as to demonstrate the penetrative qualities of the gas. All the insects were dead at the end of the exposure.

Another trial was had in the same room when but 330 grams of sulphur, or about one-third of the former amount, was burned and the room closed for twenty-four hours. With the mosquitoes were exposed bacteria of different classes such as subtilis spores and pyocyaneus, but the gas penetrated sufficiently to kill the insects and non-sporebearing organisms.

The results with the above were so good that another test was made to see whether a very small amount of the gas and a short exposure would act as well. This time 191 grams of sulphur were burned and the room was aired one hour after the sulphur was lighted so that the total exposure to the gas was one hour. The mosquitoes and bacteria were exposed as before and the result showed that all the insects were killed, except those hidden away under several layers of damp toweling. None of the bacteria were killed. In contrast to its effect on mosquitoes the action of the gas is not sufficient to kill bacterial life.

Three experiments were made with liquid sulphur dioxid. A tin containing twenty ounces of the liquid gas was opened in the room, the temperature of which was about 30 degrees C. The exposure was eighteen hours. The amount used is supposed to be sufficient for 1.728 cubic feet so that the amount was over three times that required for bacterial action. The moisture of the atmosphere was determined to be 0.2692 grams of moisture per liter. All the mosquitoes and the pyocyaneus were killed.

In the second test the conditions were the same as in the first, except that moisture in the form of steam was injected through the keyhole after the gas was set free, rendering the atmosphere completely saturated. The results were the same as in the first case, all the insects and the non-sporebearing bacteria being killed.

To determine the effect of dry gas on mosquitoes, the gas was liberated in a bell jar, but was first thoroughly dried. The air in the jar was also dried. The insects were killed instantly by the dry gas. The dry gas is not injurious to bacteria, but will kill mosquitoes in a period of time so short that even non-sporebearing bacteria are unharmed.

The experiments showed that sulphur dioxid is unexcelled as an insecticide. Very dilute atmospheres of the gas will kill the insects and the gas can be either wet or dry. Its powers of penetration are far superior to those possessed by formaldehyd, although in the moist state it is also very injurious to fabrics and metals. While it will not kill spores, this agent will take the front rank in disinfection against yellow fever, malaria and other insect-borne diseases.

INEFFICIENT POLICE IN BENGAL

THE report of the Police Department of Bengal, India, has revealed the lawlessness that has been rife in that section. The police are undermanned and the plague, census and famine have brought fresh difficulties. There has been a considerable rise in the amount of crime committed, but the police have not made the best use of the assistance at hand. Especially have they failed in cases of dacoity and burglary. The percentage of convictions to true cases reported has fallen to 36.8, or the lowest for the last eight years. This is due to the evident fact that the cases are not properly worked up before being presented to the courts. But 15 per cent. of the property stolen has been recovered and their energy has been wasted on petty investigations. The improvement in their conduct, however, has been considerable for the last few years and only four cases of torture and a considerable number of extortion have been proved true. One proof of the improved conduct in the force is the greatly decreased number of fines. More than half the force are in possession of good conduct stripes, entitling them to a rupee more per month, but as the grant is limited to 10 per cent. of the whole force, 3,006 men were unable to receive the rewards that they had earned.

There has been a rise of 11,254 in the number of crimes that are known, and, except in 1897, the total is higher than at any time in the last ten years. Burglary and theft are the causes of most of the crimes and it has been stated that the high prices are responsible for the majority of these. This seems true from the fact that in nearly all the cases the property stolen consisted of vegetable products.

The number of riots has fallen from 2,194 to 1,989 and is largely due to proceedings under the preventive sections for binding the parties down. The cause of a riot is nearly always a land dispute and a breach of the peace can usually be known beforehand. Were there a record of rights, encroachment and retaliation would not be so prevalent. There has been a large increase in the number of riots in which life was lost, as both parties usually are armed.

The need of a detective agency is apparent from the number of offenses against the person, usually murders and serious assaults. Only 32 per cent. of the cases tried ended in conviction. Dacoity has greatly increased and the number of convictions has fallen. Local bad characters are responsible for the majority of dacoity cases, but several are due to gangs from Calcutta and a close communication between the city and rural police is needed. Until the villages learn to resist the dacoits, there is no matter that is more urgent than protection from these gangs.

PURE MILK SUPPLY FOR NEW YORK

THE Board of Health of New York city has decided that no milk shall enter the city next year if the temperature is more than 50 degrees Fahrenheit. The Medical Society of the County of New York has made extensive examinations of the milk of dairies that supply the city and this action of the board is largely due to the society's recommendations. The alarming mortality among the babies in the city, due to intestinal diseases, prompted the society to these tests of milk and the results have shown that to milk is due the majority of these diseases.

The reason why the milk produces so much distress is that there is not sufficient care used to keep it clean, and what is more to the point, the milk is not kept cold. The deterioration of milk is due to bacterial growth. Under certain temperatures the bacteria find a good culture in milk and they grow with marvelous rapidity. These germs come from the air or from the articles used in handling the milk, and, when they get into the milk, they produce changes that result in the formation of toxic compounds. While it is impossible to exclude many of these microbes, care in handling the milk will greatly reduce their number, and those that are present can be rendered harmless by keeping the milk at a low temperature, which prevents the growth of the germs. It is not the germs themselves that make the trouble so much as it is the changes that they produce in the milk.

The standards that the society established made it clear that it required but a fair attention to the cows, their surroundings and their attendants to make it possible to obtain milk in a comparatively clean condition. A meeting of about fifty dealers with the medical commission of the society brought out the general expression that the milk could be easily improved with extra care and expense. The commissioners then sent out a circular offering to make examinations of milk, which, if found satisfactory, would receive a certificate of the society. The circular contained the following announcements:

"The milk commissioner of the New York County Medical Society agrees to guarantee to certify the milk of all dealers desiring such certification. A special label will be furnished for this purpose.

"The standard required to obtain this indorsement will be that the milk must not contain more than 30,000 germs or bacteria of any kind to the cubic centimetre, or about one-sixteenth of a cubic inch of the milk. The butter fat must reach 3.5 per cent. The expense of the examination will be met by the dealer."

It was found that what was pretty good milk when compared with the average did not come up to the standard of the commission. Six samples taken by inspectors of the Health Board on a cool day in November gave the following bacterial count per cubic centimetre: For No. 1, 56,000; for No. 2, 128,000; for No. 3, 256,000; for No. 4, 136,000; for No. 5, 2,880,000, and for No. 6, 35,000. Tests on a hot day in June with six samples gave the following: No. 1, 520,000; No. 2, 30,000,000; No. 3, 3,530,000; No. 4, 12,000,000; No. 5, 216,000,000; No. 6, 9,600,000. It was found that frequently the milk that has been exposed to the sun's heat reached the number of 1,000,000,000 bacteria per cubic centimetre.

On the visits of the commission to farms that supplied milk to the city, experiments showed that a fair amount of cleanliness about the cows would reduce the amount of bacteria in the milk in surprising proportions. Thus a cow that was milked in a dirty stable gave milk having 120,000 bacteria to the cubic centimetre. Another cow in the same apparent condition, milked in a pasture, gave but 26,000. Dust from a pile of dry feed served to contaminate the milk of the nearest of a row of ten cows milked in a clean stable. Much dirt gets into the milk from the body of the cow and from dirty attendants. In a clean barn where the attendants were clean in person, some dirty cows gave an average of 90,000 bacteria. When these cows were cleaned and milked by the same men, the milk contained but 2,000 germs. Men who did not take care of their hair, hands, or finger nails, and who wore dirty clothes, always had a high percentage of germs in the milk they collected. A clean pail and strainer reduced the number of bacteria from 80,000 to 5,000. When the proper precautions are taken to insure cleanliness, the so-called "cow odor" is not detected in the milk.

The future condition of the milk depends on its careful handling during the first few minutes after it is received from the cow. At a temperature of 45 degrees Fahrenheit the bacteria are not able to grow, but if, in warm weather, the milk is allowed to stand for more than an hour without being cooled, the milk will not keep sweet despite the best sanitation. Should the temperature rise but a few degrees a great increase in the bacteria will ensue. Thus milk, having a first count of 7,000, when cooled slowly to 60 degrees, in two hours gave a count of 89,000 to the cubic centimetre. The milk must be kept cool during its transportation.

To show the good that the commission accomplished on its visits, it may be mentioned that at one place the first count of the bacteria in the milk showed 445,000 germs to the centimetre. When certain defects in the management were pointed out and corrected, the count was reduced to 3,600. An expensive plant is not necessary to produce such results. All that is needed is attention to details. In fact every dealer that made the effort was able to bring his milk up to the required standard.

FIRE, WATER AND POLICE ITEMS

Ex-Chief Bonner to Organize Manila Fire Department—Anti-Noise Ordinance—Bloodhounds for Police—Meeting of New England Water Works Association—Rescued by Life Net

FIRE LOSS.—The loss by fire in November was very large and much in excess of that for the corresponding month last year and the year previous. In 1899 the loss amounted to over $11,000,000, last year to $8,500,000, while this November the total of $15,469,800 was reached.

ANOTHER POLICE "GYM."—The Police Commissioners of Bridgeport, Conn., have determined to follow the lead of other cities and establish a gymnasium for the force. Thus the officers will keep in fighting trim all the time and, from the appearance of some of them, a reduction in the corporeal dimensions would add greatly to their efficiency.

NO SPITTING IN STREET CARS.—The Tri-City Railway Company of Moline, Ill., has set a good example to other companies in taking up the fight against spitting in cars. The conductors have been ordered to eject any person that persists in violating the order of the company. There are no laws in the city against this vile habit and so the company has taken the matter in its own hands.

FUMIGATE THE CARS.—The Pennsylvania Railroad Company has issued orders that all of the passenger coaches are to be regularly fumigated that there may be no danger of carrying disease germs. This rule should also be enforced in regard to street cars. The Transcontinental Passenger Association has prepared a plan for the consideration of all the railroads, looking to the provision of a special consumption car, or ward, on each train.

CIGARETTE CONDEMNED.—The Mayor of Hamilton, O., Hon. C. S. Bosch, has taken up the cigarette evil and proposes to have the statute enforced. He sent a notice to the police department calling attention to the statute of Ohio which forbids the selling to any minor under sixteen any cigarette, cigar or tobacco under penalty of fine and imprisonment. The police were requested to notify all dealers of this section and also to arrest any boy found smoking.

NEW ASSOCIATION.—The mayors, burgesses and chiefs of the fire departments of the Cumberland Valley recently met at Chambersburg, Pa., and formed an association of all the fire companies in the section for the quick interchange of assistance in the towns. Arrangements have been made whereby towns and cities will be able to respond quickly to calls for help. It is reported that all the towns of the valley have hose couplings which will connect with each other.

FORCE CONDEMNED.—Two policemen have disappeared from the force of McKeesport, Pa., and one man has resigned after a year's service. The wife of one of these officers stated that her husband was a good man until he got a position on the force. She said that the McKeesport police would ruin any man and her sentiments were corroborated by the man who resigned. She also added that no man could remain any length of time on the force of that city and be decent.

BLOODHOUNDS FOR POLICE.—The trials of bloodhounds that took place in Warwickshire, Eng., recently, resulted in some satisfactory work. Within fifty minutes three couples found their quarry after a run of over four miles. Even when the trail crossed a road the dogs lost the scent for a moment only, but quickly found it again. Without assistance they worked out the line patiently and accurately. Some American cities have made similar use of bloodhounds.

SALT WATER SYSTEM.—In order to assist in the economy of water in San Francisco, Cal., it has been suggested that the city be supplied with salt water for strictly sanitary purposes. A duplicate pipe system would be necessitated, of course, but the source of supply would be unlimited. As only one-half of the daily consumption of water is for drinking and bathing, the remaining half could be supplied by salt water. For sprinkling streets, flushing sewers and extinguishing fires salt water could be used.

NEW METER SYSTEM.—It has been definitely decided to adopt the meter system in Columbus, O., and the householders will be required to purchase the meters. As an inducement to the purchase of meters, the minimum rate will be decreased. The installation of meters will be gradual. As a safeguard to secure full payments, customers are required to make a deposit at the water works department. There is a disposition to have this method changed by having the Legislature make an unpaid water bill a lien against the property.

TO SUPPRESS COCAINE HABIT.—The City Council of Fort Worth, Texas, has passed a resolution instructing the city attorney to frame an ordinance looking to the suppression of the cocaine habit and the sale of pernicious drugs in the city. It is hoped that a farm will be established where the users of drugs can be sent in the hope that they will recover from the habit. Chief Rea, of the police department, has had some experience in reforming a woman cocaine "fiend" and is confident that others of the same kind can be rescued.

RESCUED BY THE NET.—The great service that the Browder life saving net can render in the rescue of people in burning buildings was recently shown at a fire in Cleveland, O. The fire made such rapid headway that all the occupants could not be gotten out by the escapes and ladders and several were compelled to jump from the fifth floor. Two that jumped were hurt, but this was not the fault of the net, but was due to the fact that one jumped so quickly after the other that the second fell on the first before she could be gotten out of the net.

MUST TAKE NO CHANCES.—The Police Commissioners of Spokane, Wash., have made a ruling that it is the duty of a policeman to answer every call for help, even if ninety-nine times out of a hundred it is a false alarm. The case in point was the trial of an officer for failure to answer cries for help. The officer claimed that the cry sounded like "hello," and that, under the circumstances, he would do the same again. The president of the Board told the officer that he was public servant and that the moment he thought that he was not he had better resign.

ANTI-NOISE ORDINANCE.—The Hoboken, N. J., Council has passed an ordinance prohibiting the blowing of fish horns and other noise-making instruments between the hours of eight in the evening and eight in the morning. The police have been instructed to arrest all venders who violate it. For each offense the offender is liable to a fine of $50. Even organ grinders will no longer be allowed to grind out their tunes during prohibited hours. The hospitals, for whose benefit the ordinance was passed, and houses in which are the sick will now have peace and the sick a chance for recovery.

POLICEMEN FOR THE CAPE.—The English government has applied to Scotland Yard for aid in procuring 100 policemen and detectives for the Cape. The men sent out from Glasgow some time ago protested against the treatment they received. Their pay, while being higher than that in Glasgow, was not sufficient to cover the additional cost of living. This and other complaints have been attended to by the authorities and the men are now satisfied with their position. The men that go out from London will have the advantages that the complaints of the Glasgow men have secured for them.

"EMBALMED" MILK.—Over a dozen milk dealers of Williamsport, Pa., have been found guilty of using formaldehyd as a preservative in their milk. Samples were secured when the milk was brought into the city and were hurried to the State College where the chemist made analysis. Of the forty-eight samples taken, fourteen were found to be adulterated. This consisted in skimming, watering, coloring and preserving. Formaldehyde was used by the majority in preserving the supply. The law provides a severe penalty for this offense. A fine of from $50 to $100, six months' imprisonment, or both, can be imposed by the court.

HUNTING MICROBES.—President John D. McGill of the Health Board of Jersey City, N. J., recently ordered that specimens of dirt should be taken from houses in the most densely populated districts and subjected to microscopic and bacteriological tests. The inspectors descended upon the tenements and caused great embarrassment to the women by prying in dark corners and under oilcloths in quest of breeding spots for microbes. Their scrapings were placed in bottles, carefully labeled, and taken to the department for examination. The inspectors hinted that a liberal use of soap and water would prevent the Health Board ordering their premises cleaned. As a consequence, the sale of soap in the city has been brisk.

UNDERWRITERS RESPONSIBLE.—The necessity for the underwriters to refuse to insure a building until it is built reasonably fire-proof, or at least does not contain direct invitations for the spread of fire, was shown by the recent disastrous fire in a furniture warehouse in Philadelphia, by which twenty-five lives and a quarter of a million dollars' worth of property were lost. In this building were two elevator shafts lined with wood, the ceilings were of wood and there were no sprinklers in the cellar where the fire started. Of course the rates were very high, but the loss that the underwriters have had to pay more than balances the difference between the ordinary rates and the ones charged in this case.

TO RUN ELEVATORS.—Chief Foley of the fire department of Milwaukee, Wis., has issued orders that the firemen shall learn to run elevators so that, in case of fire, they will be able to rescue persons from the upper stories should the regular operators be frightened and decamp. The chief holds that occupants of a burning building will have confidence in a fireman at time of peril. It has been pointed out that during the excitement of a fire, a trained elevator man would be more competent to run the cars, as his instinct would come to his aid at such a time. Several well known instances of daring rescues by elevator men would tend to prove that they are as apt to keep their heads at such times as would the firemen.

SCHOOL FIRE DRILL.—The great advantage that is derived from drilling school children to pass out in order when the fire bell rings, was well demonstrated at a recent fire in a school in Evanston, Ill. The courage displayed by one of the little girls in the class contributed to the safe escape of the children, for, when the fire started, she stepped to the piano and played a stirring march. The fire bell rang, the children arose at the command of the teacher and filed out quietly as they had been accustomed to in the practice drills. The children have a weekly fire drill and in order to make it as realistic as possible, Chief of the Fire Department Mersch has permitted the teachers to turn in a regular fire alarm, the teacher first telephoning to the department so that the engines would not respond.

FIRE CHIEF FOR MANILA.—The position of Chief of the Fire Department at Manila, P. I., has been offered to Mr. Hugh J. Bonner, formerly Chief of the Fire Department in New York City. The present chief at Manila, one Drake, has not given satisfaction, causing the department to be severely criticised by the press. Mr. Bonner will have charge of the department at Manila and also supervision over the departments in other cities. His salary will be $3,000 a year, and allowances for organizing other departments. The Philippine Commission is determined to make the Manila department a model one. It is a paid department, while those in other cities are volunteer with the most antiquated apparatus. New engines will be ordered, the men paid salaries and Americans placed in responsible positions.

VOLUNTEERS MUST GO.—On December 1, Elizabeth, N. J., a city of more than 50,000 inhabitants, substituted for its present old-fashioned volunteer firemen a paid force. Some of the few cities which still retail a volunteer force, though supplemented or directed by a few paid members, are Binghamton, N. Y.; Holyoke, Mass.; Newburgh, N. Y.; Portland, Me.; Reading, Pa.; Schenectady, N. Y.; Scranton, Pa.; Troy, N. Y.; Wilmington, Del., and Yonkers, N. Y. Troy is the most important city which keeps volunteers. In New York, the boroughs of Manhattan, Brooklyn and the Bronx are served by a paid department, Queens by some paid firemen and some volunteers and Staten Island by a volunteer force exclusively. Boston, Denver, Richmond and New Haven have paid departments, but some volunteers in reserve as well.

BOILED WATER MADE PALATABLE.—Bizzozozero states, in a German periodical, that most people object to purifying water by boiling for various reasons. He gives the most important objections as follows: (1) The water loses its air, and is not so digestible. (2) The water loses its free carbonic acid gas, which normally gives it a piquant taste. (3) There is a loss of lime salts, which are necessary to our nutrition. (4) Boiling gives water a specific unpleasant taste. Bizzozozero takes up these objections one at a time. He shows that the air can easily be reintroduced into water after boiling merely by shaking it for a minute or two. He shows that the amount of carbonic acid gas normally present in drinking water is entirely too small to impart any taste at all to it. The lime salts in the water are quite unnecessary, as they are supplied better in other food. He claims that no specific unpleasant taste occurs if the water is boiled in clean glass or enamelled ware receptacles and cooled off rapidly afterwards. He considers this the best all-round method for sterilizing drinking water.

MEETING OF NEW ENGLAND WATER WORKS ASSOCIATION.—At the December meeting of the New England Water Works Association, held at Young's Hotel, Boston, Mass., on December 11, only one paper was read. This was, "Swamp Drainage for Watershed Improvement," by Mr. Edward S. Larned, of the engineering staff of the Metropolitan Water Board of Boston. It described the work of the Metropolitan Water Commission in connection with one watershed where the discoloration of water had given trouble. The cause of the color was traced to small swamps within the watershed in which the water had stood for a long time. A system of ditches was decided upon and the land thus drained became valuable to the owners where previously it had yielded nothing at all. The ditches were eleven inches wide with sloping sides paved part of the way to the top with stones. The cost of the work and maintenance was surprisingly low. Reports of committee were read and letters and opinions presented from absent members. Further discussion will be had at the January meeting.

RUBBER GLOVES FOR FIREMEN.—In a paper read at the Pennsylvania State Firemen's Convention held at Philadelphia in October, Mr. James H. Brown, chief of the fire department of Newcastle, Pa., spoke of the necessity of the firemen wearing rubber gloves while working at a fire. The danger that arises from the proximity of wires carrying high tension currents renders such a course necessary. Not only should the firemen wear rubber gloves but also rubber boots and both should be of the best as they are liable to become water soaked. Even the men that handle the play pipe should not be without them as at any time a current may leave a wire and travel down the stream of water. Chief Brown sounds a warning against leaning ladders against wires even if they are insulated. After wires are cut all other wires in the vicinity should be avoided as if they carried the plague. The Chief holds the opinion that all wires carrying high tension currents should be provided with switches situated at intervals of about one-fourth of a mile. All danger could thus be avoided by cutting out the current by the switches during the fire. The electrical companies should furnish one or two good linemen to respond to every alarm so that they could take care of the dangerous wires. The chief engineer of the fire department or the officer in charge of a fire should have complete control of the electric wires in that when he orders them cut off they should so be treated.

CURRENT LITERATURE ON MUNICIPAL TOPICS

Reviews of Some Important Books—What the Magazines and Reviews Have to Say About Civic Affairs—Municipal Reports Received

BOOKS

The third edition of *Water and Water Supplies,* by John C. Thresh, D. Sc., M. D., has just been issued. That a sale of so many copies of this work should require the issuing of three editions within a short interval of one another speaks well for its popularity. The book has been thoroughly revised and enlarged and additional chapters prepared on the Protection of Water Supplies, making this edition some eighty odd pages larger than the second, a review of which will be found on page 184 of Volume XI of the MUNICIPAL JOURNAL AND ENGINEER. P. Blakiston's Sons & Co., Philadelphia, Pa. Cloth 12mo., 527 pages; price, $2.00 net.

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Examination of Water is the title of a little book by William P. Mason, professor of chemistry in the Rensselaer Polytechnic Institute, at Troy, N. Y. But within the 131 pages which make up this volume will be found information and suggestions on the chemical and bacteriological analysis of water supplies that will be of the greatest importance to water examiners. The book is divided into two parts. The first portion deals with the chemical analysis and especially with the items properly included in the scope of a sanitary examination, taking for granted a knowledge of ordinary quantitative analysis. In the second portion under bacteriological analysis, only those tests are given which would be of the most assistance to the examiner. Instruction is given as to the best methods of preparing the different culture media, sowing, incubating and counting the colonies of bacteria, and the tests and difficulties of diagnosing properly cases of typhosis bacillus, fæcal pollution, etc. Throughout, the author emphasizes the importance of the chemist becoming fully acquainted with the history of the water he is about to examine before deciding the question of fitness of the water for use, because the local conditions will often introduce some element in the water, the presence of which in some other locality would render the water unfit, but which in the present instance can be easily accounted for. This would necessitate a thorough personal knowledge of the surroundings of the source of supply. John Wiley & Sons, publishers, New York. Price, cloth, 8vo., $1.25.

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People and Poverty is a short but vigorous protest against the wholesale acquirement of property by the great combinations of capital. The author, Edwin B. Jennings, has written in a short, concise way of the gaining, the sharing and the using of wealth and, while at times rather too alarming in style, points out many ways in which the trusts are getting richer and the poor people poorer. The book offers suggestions for careful consideration. Published by the Abbey Press, 114 Fifth avenue, New York. Cloth, 109 pages, 50 cents.

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One of the handbooks for charity workers that cannot but be of the greatest value to them is *The Practice of Charity,* by Edward Thomas Devine, Ph. D., general secretary of the Charity Organization Society of the city of New York. It is a small volume of 186 pages and tells of the right and the wrong way of giving aid to the needy. The necessity for the existence of charity is strongly defended, for this virtue has some enemies as well as many admirers. The author tells of those that need help, of the substitutes for charity, of how charity should be organized and of volunteer and professional service. The relation of the church and charity is also defined. He lays down some elementary principles and cites some illustrative problems. In the appendices to the book will be found a model for a constitution for a charity organization society. Lentilhon & Co., publishers, 150 Fifth avenue, New York. Price, cloth, 60 cents net.

Good roads is a subject on which no end of books have been made. What constitutes the best road is something about which engineers differ most widely and a method that one states to be absolutely the most correct for building a certain kind of road is flatly declared by another to be all wrong. In *Economics of Road Construction* the author, Halbert Powers Gillette, quarrels repeatedly with the time-honored precepts laid down by such men as Macadam as to the best methods of road construction. The methods employed by the Massachusetts Highway Commission in the grades and ditching of roads are not the best methods, according to Mr. Gillette. The data and tables of Trautwine in regard to the cost of earthwork, he claims, are not within 50 per cent. of the truth for short hauls, mainly because Trautwine assumes that machines hold the amount of earth indicated by the catalogue size and in other minor details. The writer gives his own tables for excavation, traction, etc., and explains just how to estimate and go to work most economically in the work of building roads. After a short historical review of road building, he takes up the subjects of earth, gravel, macadam and telford roads, showing how they should be built, the kind of stone best for each and gives tables to show the cost of them. At the end of the discussion he summarizes the cardinal points in the foregoing matter and shows that, where once good roads are built, the verdict of all is that more should be constructed like them. Published by the Engineering News Publishing Company, New York. Cloth, forty-one pages, $1.00.

PERIODICALS

Among other excellent articles, *Gunton's Magazine* for December contains a short one on the *New Municipal Policy* that is to be pursued by the incoming administration in New York. It is pointed out that Mr. Low will appoint men to office in consideration of their fitness for the place and irrespective of any "pull" that they may possess. Inasmuch as the fusion victory was secured by a combination of parties without stipulation of reward, the Mayor will be unhampered by the spoilsmen in apportioning the offices according to the work done by the different parties to the combine. Extracts from Mr. Low's speeches are quoted to show the policy he will pursue when once in office. New York, N. Y. Price $2.00 a year; 20 cents a copy.

The American Journal of Sociology contains an article by Francis R. Cope, Jr., on *Tenement House Reform,* and deals especially with its practical results in the "Battle Row" district in New York City. He tells how the City and Suburban Homes Company erected some model tenements in the district and thus forced the other owners of property through sheer business competition to renovate their houses. The article is long and treats in general of the conditions on the East side and the greatly overcrowded state of the tenements all over the city. The conclusions drawn are that a private company, run on sound business principles, can make a profit from model tenements, and that such a company has a tremendous influence for good in many ways. Frank A. Fetter, in a lengthy article on the *Subsidizing of Private Charities,* takes up the present condition of charities in the United States and presents a list of the states that appropriate money for private charities and the amounts allotted. He presents the arguments for and against subsidies to private charities and concludes, from the state of the problem, that the public sentiment upon it is not one of satisfaction. He states that the logical outcome of the situation demands that the subsidies be abolished, that it is a mediæval device and does not accord with American ideas. The advocates of subsidies are entirely on the defensive and are losing ground. *Boston's Experience with Municipal Baths* forms the subject for an interesting article by Jane A. Stewart. She explains how the city came to install the baths and the success with which the venture has been met. The baths are located according to the needs of the vicin-

ity and the attendants for each bath are selected with reference to the class of people using the same. Better service is thus rendered for the attendants are in accord with the patrons. Chicago, Ill., November, 1901. Price $2 a year, 35 cents a copy.

The Proceedings of the American Society of Civil Engineers is full of good things in the line of civil engineering. *A Proposed Solution of Some Hydraulic Problems* is the title of a paper by Charles H. Hutton, a member of the society. Three discussions on the *Flow of Water in Pipes, Current Meter and Weir Discharges* and on the *Antecedents of the Septic Tank* present much valuable material for reference. New York, November, 1901.

The North American Review for December contains an article on *Publicity as a Means of Social Reform,* by W. H. Baldwin, Jr., chairman of the Committee of Fifteen which was appointed to investigate the conditions of vice in the city of New York. His article forms a review of the work of the committee, showing the aims which they had in view and the method pursued in carrying on the work. It was the aim of these gentlemen to reform conditions only and not the individual, to demonstrate to the community that vice was flourishing and to prove that the authorities were aiding and abetting it. All of these things the author claims were done, but states that "the necessity for continued publicity is shown by the fact that, after twelve months of public statements in the press, etc., prominent men have not yet realized the exact conditions which exist." New York, N. Y. Price $5.00 a year, 50 cents a copy.

The Rebuilding of New York, by M. G. Cunniff and Arthur Goodrich, forms an interesting article in *The World's Work* for December. It tells how a new city is being formed of steel and placed on bed rock. The new subway, which is the greatest in the world, the bridges and tunnels that will bind together all the boroughs and the great office buildings and apartment houses will make New York the most convenient city in the world. New York, N. Y. Price $3.00 a year, 25 cents a copy.

The December issue of *The Sanitarian* contains the report of the Milk Committee of the Medical Society of the County of New York which was appointed to investigate *The New York Milk Supply,* the subject of the article. The report is written by Henry D. Chapin, C. D. Under *The Medical Inspection of Schools,* Dr. E. M. Green, Medical Inspector of Schools in Boston, Mass., tells of the methods pursued in his department. Brooklyn, N. Y. Price $4 a year, 35 cents a copy.

The issue of December 7 of *Charities* contains the report of the committee on "Improved Housing" at the second New York State Conference of Charities and Correction. The article, *Housing Conditions in the Principal Cities of New York,* is written by Edward T. Devine, General Secretary of the Charity Organization Society of New York City. The tenement conditions in each of the cities are taken up and illustrations are given of the typical houses in each New York, N. Y. Price $2.00 a year, 25 cents a copy.

The Annals of the American Society of Political and Social Science for November has an article by Edward W. Bemis on *The Columbus Attempt to Secure Three-Cent Fares.* It gives a sketch of how the Columbus, O., Street Railway Company secured its franchise and the offers that Hon. Tom L. Johnson, of Cleveland, made to the city authorities in behalf of a cheaper fare. Under *Notes on Municipal Government* are items on the Providence Street Railway Franchise and Transfers, Woman's Suffrage and Municipal Politics in Colorado and Wyoming, and Municipal Legislation of 1901 in Nebraska. Philadelphia, Pa. Price $6.00 a year. $1 a number. Issued bi-monthly.

In *Everybody's Magazine* for November is an article by Percy S. Grant on *Are the Rich Responsible for New York's Vice and Crime?* in which he discusses the question *pro* and *con,* pointing out where the rich could do much to better the city and the effect that their manner of living has upon the social conditions. New York, N. Y. $1 a year, 10 cents a copy.

The Sewage Question During the Last Century. Mr. H. Alfred Roechling in *The Surveyor.* London, Eng., December 6, 1901. Price 3d. a copy.

The Story of Spokane, by W. W. Durham, in the *National Magazine* for December, 1901. A story of how the city was founded. Boston, Mass. Price per year, $1.00; 10 cents a copy.

The Journal of the New England Water Works Association contains five interesting papers read by members before the association. *The Bacteriological Analysis of Water and Its Interpretation,* by C. E. A. Winslow; *The Work of Sanitary Inspection on the Metropolitan Water Works,* by William W. Locke; *Experiences in Reducing Water Ram Caused by Direct-acting Pumping Engines,* by George E. Winslow; *The Pollution of Streams by Manufactural Wastes and Methods of Prevention,* by H. W. Clark; and *Water Supplies of Vermont,* by Charles P. Moat. The discussion of all but the last of these papers is presented at the end of each. Boston, Mass., December, 1901. Price $3.00 a year, $1 a number. Issued quarterly.

George F. Babbitt writes for *The Forum* on *Licensed Gambling in Belgium.* New York, N. Y., December, 1901. Price $3.00 a year, 35 cents a copy.

City officials as well as men of business should have at hand a copy of *The Official* guide, which gives the latest information as to time tables and schedules of all railroads and steamboat lines in the country. The importance of having this information at hand cannot be overestimated by those who are liable to travel at a moment's notice, for in this book, issued and corrected monthly, will be found complete time tables showing all connections of roads and boats. One does not have to send to the nearest railroad office for a time table with the ever present risk of their being "just out" of the particular one wanted. Whenever a change is made in a schedule the information is conveyed to the publishers of *The Guide* to be incorporated in the next issue. Published by the National Railway Publication Company, 24 Park Place, New York, N. Y. Price $8.00 a year, 75 cents a copy.

The Contract Journal for December 11, 1901, contains the first portion of a paper presented to the British Association of Waterworks Engineers on *The Design, Construction and Cost of Open and Covered Reservoirs,* by William Ingham, water engineer of Torquay. The article contains about 3,000 words and there are an abundance of cuts showing the methods pursued at different places. London, Eng. Price 6d. a copy.

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COMPARATIVE BIDS FOR CONSTRUCTION WORK

PAVING

CLEVELAND, O.—Bids were received for paving Detroit street with brick and asphalt, with five-year guarantee:

	18,000 cu. yds. grading.	20 catch basins.	1,000 ft. 9-in. basin outlets.	100 yds. sewer, br. mas.	35,000 lin ft. 5 x 20 in. curbg.	54,000 sq. yds. con. found.	3,900 sq. yds. 4-inch br. paving.	50,000 sq. yds. asph. pav.	Additional guarantee.	50 cu. yds. concrete.	Total.
Estimated cost	$.20	$35	$.25	$5.00	$.29	$.50	$1.00	$1.25	$.05	....	$116,600
Ayers Asphalt Paving Co	.25	35	.55	9.00	.35	.49	1.00	1.10	.05	$5.25	104.523
L. B. Stanley	.15	35	.30	7.00	.30	.45	.90	1.30	.10	6.00	108,010
Cleveland Trinidad Paving Co	.25	35	.50	5.00	.33	.40	1.00	1.13	.04	3.50	99,925
Barber Asphalt Paving Co	.22	33	.35	7.15	.38	.48	1.10	1.29	.05	3.30	113,860

COMPLETING DAM

PITTSFIELD, MASS.—Bids for completing Ashley Lake dam were received as follows:

		Thos. Kearney.	Donahue.	Geo. M. Atkins.	C. N. Taylor.	Troy Public Wks. Co.	Dwyer Bros.	Frank Pidgeon.	O'Connell & Son.	John Beattie.
Earth excavation	300 cu. yds.	$0.55	$0.70	$0.40	$0.60	$0.75	$1.00	$0.683	$1.25	$1.00
Embankment	5,000 cu. yds.	.45	.50	.45	.50	.40	.65	.63	.75	1.00
Lumber in place	5,000 ft.,B.M.	25.00	40.00	40.00	40.00	30.00	30.00	31.50	50.00	60.00
Concrete	1,450 cu. yds.	7.00	7.75	8.00	8.25	7.50	8.00	8.40	8 25	8.75
Uncoursed rubble	150 cu. yds.	6.50	6.50	6.00	8.25	10.00	9.50	10.50	7.25	7.50
Coursed rubble	250 cu. yds.	7.50	9.25	14.00	10.25	15.00	10.00	12.60	21.00	19.00
Spillway		182.75	172.00	200.00	100.00	250.00	175.00	135.45	250.00	232.20
Coping	3,170 sq. ft..	1.00	.90	1.00	1.10	1.25	1.25	1.313	1.75	2.00
Cobble paving	540 sq. yds.	.90	1.00	1.00	1.00	1.00	1.00	1.575	.75	1.50
Gate house		685.00	800.00	700.00	800.00	500.00	1,100.00	1,150.00	700.00	1,200.00
Laborers, per day		2.00	2.00	2.00	1.80	2.00	1.75	2.00	2.00	1.60
Masons, per day		4.50	4.00	4.00	4.50	5.00	4.00	5.00	4.00	3.50
Helpers, per day		2.00	2.00	2.50	2.50	2.00	2.00	2.50	2.75	1.80
Single team and drivers, per day		3.50	3.00	4.00	3.50	3.00	3.00	3.00	3.00	3.00
Double teams and drivers, per day		4.50	4.50	5.00	5.00	5.00	4.00	6.00	4.50	4.75
Foreman, per day		4.00	5.00	5.00	5.00	5.00	5.00	5.00	4.50	5.00
Total		$20,064	$21,800	$23,180	$23,570	$23,753	$25,003	$26,719	$29,578	$32,745

SEWERS

NEW YORK, N. Y.—Bids for sewer in Eighty-eighth street, Brooklyn, received as follows:

		Houlihan & King.	G. F. Maloney.	Dennis Norton.	J. J. Creem.	J. P. Graham.	Segretto & Dalton.	H. Hesterberg.
24-in. pipe	1,060 lin. ft.	$3.90	$3.65	$2.93	$4.00	$3.85	$3.56	$3.15
18-in. pipe	2,430 lin. ft.	2.80	2.90	1.96	3.00	2.20	2.70	2.50
15-in. pipe	2,330 lin. ft.	1.70	1.90	1.38	1.85	1.43	1.74	1.70
12-in. pipe	4,395 lin. ft.	1.50	1.60	1.13	1.40	1.20	1.32	1.10
Manholes	93 each	47.50	29.00	31.50	32.00	30.00	35.00	32.00
Receiving basins	25 each	100.00	87.00	100.00	90.00	100.00	100.00	90.00
Foundation plank	30 M. ft.	20.00	16.00	16.00	17.00	20.00	22.00	18.00
Sheeting	100 M. ft.	20.00	23.00	16.00	17.00	20.00	18.00	18.00
Total		$30,709	$30,027	$23,560	$29,329	$25,923	$28,405	$25,765

For sewer in Broadway, Nagle avenue and One Hundred and Eighty-first street, New York:

		B. J. Sullivan	A. C. Gildersleeve.	Norton & Dalton.	New York Sewer Cons. Co.	C. W. Collins.	W. J. Moore.	W. E. Welsh.
48 x 32-in., Class I	557 lin. ft.	$6.25	$7.00	$6.50	$5.85	$6.00	$7.00	$6.20
48 x 32-in., Class II	2,812 lin. ft.	6.70	7.50	6.80	5.85	7.00	7.00	6.20
48 x 32-in., Class III	200 lin. ft.	7.90	8.00	8.00	6.90	8.00	8.00	6.20
48 x 32-in., Class IV	36 lin. ft.	5.65	6.00	6.30	5.85	5.00	8.00	6.20
15-in. pipe	522 lin. ft.	3.85	3.50	4.00	3.75	3.00	4.00	3.00
12-in. pipe	50 lin. ft.	1.50	1.00	2.00	1.00	2.50	....	2.00
Receiving basins	5 each	140.00	100.00	150.00	150.00	150.00	....	150.00
Sheet piling	10 M. ft.	25.00	....	20.00	25.00	20.00	....	.01
Foundation plank	5 M. ft.	30.00	....	20.00	17.00	20.00	....	.01
Rock	1,700 cu. yds.	2.40	2.50	3.00	3.00	3.00	....	.01
Total		$31,370	$33,432	$32,986	$29,482	$32,647	$29,559	$24,784

WATER MAINS

NEW YORK, N. Y.—Bids were received as follows for laying water mains from standpipe at New High-Service Pumping Station to Jerome avenue:

		W. E. Welsh,	J. J. McQuade.	F. Thielman, Jr.	Cunningham & Kearns.	Norton & Dalton.	C. W. Collins.	F. V. Smith Con. Co.	J. Cornwall, Jr.	J. S. Rogers.
Cast-iron pipe	4,200 tons	$25.50	$25.00	$24.00	$25.00	$23.00	$24.00	$24.50	$20.00	$23.75
Special castings	60 tons	50.00	50.00	60.00	52.00	52.00	53.50	60.00	60.00	51.00
Rock excavation	4,500 cu. yds.	.40	1.50	2.50	2.00	3.00	.50	2.50	.01	.30
Earth excavation	32,500 cu. yds.	.40	.40	.40	.35	.30	.50	.40	.01	.30
Filling	30,000 cu. yds.	.40	.30	.25	.15	.30	.50	.10	.01	.30
Laying pipe:										
48-in.	100 lin. ft.	1.50	1.10	1.30	1.40	2.00	1.50	2.00	2.60	2.00
36-in.	12,700 lin. ft.	.70	1.00	.95	1.00	.80	.90	.90	2.60	.90
20-in.	16,500 lin. ft.	.50	.60	.60	.50	.50	.50	.60	1.60	.60
12-in.	1,000 lin. ft.	.25	.40	.40	.35	.25	.40	.40	.30	.30
6-in.	1,200 lin. ft.	.15	.30	.25	.30	.18	.35	.20	.15	.30
Setting 48-in. stop cock		150.00	1,200.00	300.00	150.00	100.00	100.00	250.00	250.00	200.00
Furnishing and setting:										
36-in.	4 each	700.00	550.00	800.00	700.00	580.00	650.00	850.00	600.00	675.00
20-in.	8 each	300.00	250.00	250.00	340.00	280.00	300.00	350.00	300.00	320.00
12-in.	12 each	60.00	50.00	80.00	70.00	55.00	65.00	75.00	75.00	60.00
6-in.	27 each	30.00	15.00	38.00	29.00	27.00	27.50	35.00	40.00	30.00
Hydrants	23 each	70.00	20.00	70.00	70.00	65.00	70.00	70.00	90.00	75.00
Blow-offs	10 each	15.00	30.00	20.00	15.00	20.00	10.00	10.00	15.00	15.00
36-in. pipe box	70 each	8.00	1.00	12.50	8.00	6.00	4.00	10.00	12.00	8.50
20-in. pipe box	20 each	5.00	1.00	10.00	4.00	5.00	4.00	5.00	8.00	5.00
Paving	100 sq. yds.	.01	1.00	.30	.50	.45	.30	.50	.01	.70
Macadam	14,500 sq. yds.	.01	.20	.75	.70	.50	.01	.50	.01	.50
Curbing	500 lin. ft.	.01	.20	.05	.10	.10	.10	.10	.01	.10
Brick work	180 cu. yds.	10.00	12.00	12.50	9.00	10.00	9.00	10.00	15.00	12.00
Concrete	10 cu. yds.	10.00	3.00	5.00	5.00	5.00	7.00	4.00	8.00	2.00
Total		$166,211	$172,965	$183,666	$176,688	$168,725	$167,402	$176,215	$161,611	$164,450

ELECTRIC LIGHTING STATISTICS FOR AMERICAN CITIES

Including Those Having a Population of from 1,000 to 11,000 Given in Order of Population

Place.	Population.	Arc system, arcs capacity.	Incandescent system, lamps capacity.	No. public arcs.	Hours per year lighted.	Price, arc. Public, per year.	Price, arc. Commercial, per month.	Price, incandescent. Public, per year.	Price, incandescent. Commercial, per month.	Power used.	Cost boiler fuel per ton.
Hollister, Cal.....	1,315	40b	1,000	21	†	$114.00	$12.00		kw-h .125	S	$1.75
Merced, Cal.....	1,969	50b, 25a	3,000	16	A. N.	120.00	10.00	(2) $13.20	(1) A. N. .650	W	
Ripley, O.....	2,248	65b	700	43	4,015	80.00	4.50	(1) 5.00	(2) kw-h .008	S	1.75
Geneseo, N. Y.....	2,400	60b	750	44	A. N.	65.00			(2) am-h .010		
Clyde, N. Y.....	2,507	50b	1,600	38	1 A. M.	60.00		(3) 69.96	kw-h .140	S	2.60
Chico, Cal.....	2,640	100b		33	§ †	108.00	10.00			S	¶ 4.50
Danielsville, Conn....	2,823	85a	1,200	47	1,800	72.00	6.25	(4) 16.00	kw-h .200	S	4.25
Woodland, Cal.....	2,886	125a	700	30	†	120.00	§ 10.00	(1) 12.00	(1) 1.250	S	10.50
Shelbyville, Ky.....	3,016	35b	700	35	3 A. M.	80.00		14.00	kw-h .150	S	2.50
Lebanon, Ky.....	3,043	50a	1,850	32	2,208	89.00			kw-h .150	S	2.50
Warsaw, N. Y.....	3,048	60b	1,500	31	§ †	65.00	5.42	(1) 12.00	kw-h .140	S	2.00
Santa Monica, Cal....	3,057	50b	20,000	40	3,200	108.00	|| 6.00		kw-h .200	S	*.95
Decatur, Ala.....	3,114	95a	2,000	30	4,745	90.00	9.00		(1) § 1.250	S	2.00
Nevada City, Cal....	3,250	50b	3,000 h-p	42	†	84.00	7.00		(1) .330	W	18.00
Palatka, Fla.....	3,301	60b	1,000	17	A. N.	82.00	7.50	(2) 15.00	§ .500	S	¶ 2.25
Marysville, Cal.....	3,497	50b	8,000	39	A. N.	82.20	8.65	kw-h 1.20			
Carlinsville, Ill.	3,502	75	43	48	A. N.	72.50	7.50	(2) 15.00		S	
Sewickley, Pa.	3,568	100	2,000	54	A. N.	70.00	5.83		am-h .010	S	1.00
Mendota, Ill.....	3,736	25b	1,200	19	2,190	$84 to 120	b 6.00	18.00	(1) lp-h .010	S	2.30
Ripon, Wis.....	3,818	a	1,000	4	†	§ 84.00	7.00	(1) 12.00	kw-h .200	S	3.15
Murfreesboro, Tenn...	3,999	12a	1,100	11	†	85.00			(4) 1.350	S	2.25
Ravenna, O.....	4,003	80b	750	60	2,200	72.50			kw-h .150	S	2.00
Rich Hill, Mo.....	4,053	35b		27	A. N.	80.00	6.66			S	1.25
Oberlin, O.....	4,082	100	600	47	1,500	50.00	6.00		.500	S	2.30
Washington, Ia.....	4,255	50a	650	36	§ †	68.00	5.50	(4) 15.00	(1) .750	S	2.00
Reno, Nev.....	4,500	95a	6,400	21	A. N.	84.00	A. N. 8.00		(1) || .750	S & W	¶ 5.50
Towanda, Pa.	4,663	90b	2,500	40	1 A. M.	60.00	5.00	(2) 25.00	per hr. .01 to .05	S	1.50
Fairfield, Ia.....	4,689	45a	500				a 5 to 6		kw .160	S	1.43
Bakersfield, Cal.....	4,836	75b	10,000	45	3,000	96.00			kw-h .120	W	
Somerville, N. J.....	4,843		3,500	240	4,000		kw-h .15	kw-h .15	kw-h .150	W	
Texarkana, Ark.....	4,914	50b	1,500	8	A. N.	120.00	12.50		kw-h .250	S	2.50
Santa Anna, Cal.....	4,933	80b	9,000	12	§ †	72.00	|| 6.00	(1) 7.20	kw-h .150	W	
Plattsmouth, Neb....	4,964	35	600	22	§ †		6.00	(2) 12.00	(1) .750	S	2.00
Bath, N. Y.....	4,994	125a	2,200	63	4,000	75.00	3.00	(2) 18.00	kw-h .140	W & S	2.35
Ilion, N. Y.....	5,138	150b 100a		168	4,000	87.00	b 6.00		kw-h .200	S & W	3.00
Centreville, Ia.	5,256	80b	100kw.	53		72.00	5.50		(1) .850	S	.60
Bristol, Tenn.....	5,271	100a	3,600	50	3,800	78.00	6.50	kw-h .12	kw-h .120	S	1.50
Brattleboro, Vt.....	5,297	50b	2,500	50	A. N.	110.00		(4) 18.00	kw-h .150	S	5.00
Thomasville, Ga.....	5,322	50a	1,200	22	†	105.00	8.75	(1) 4.80	(2) 2.500	S	¶ 1.75
Trinidad, Colo.....	5,345	150b	1,500	59	1,600	† 96.00	§ 12.50		kw-h .150	S	
Catskill, N. Y.....	5,484	80a	1,300	56	4,000	† 38.00			kw-h .175	S	3.50
Phoenix, Ariz.....	5,544	50b, 75a	4,500	54	†	96.00	10 to 15	kw-h .20	kw-h .200	S	5.00
Helena, Ark.....	5,550		3,600	25	†	120.00	10.00		(1) .750	S	2.00
Conshohocken, Pa....	5,762	90b	2,500	50	4,000	87.50	8.00	(4) 16.00 Avg.	kw-h .200	S	2.55
Norwalk, Conn.....	6,125	295a	6,000	92	3,000	74.00		(2) 18.00	kw-h .160	S	3.50
Montpelier, Vt.....	6,266	130b, 100a	15,000	155	1,800	Avg. 39.50	3.00		kw-h .100	W	
Santa Barbara, Cal...	6,587	150b	5,000	90	2,200	102.00	§ 9.00	(3) 12.00	kw .200	S	*.85
Bellefontaine, O.	6,649	245b	1,500	34	3,347		4.67		kw .083	S	2.20
Baker City, Ore.....	6,663	100b	5,000	50	A. N.	96.00	5 to 10		kw .100	S & W	Sawdust
Centralia, Ill.....	6,721	100b	1,500	71	†	71.00			(1) .500	S	.85
Lock Haven, Pa.....	7,210	250b	6,000	70	4,000	72.00	5.00		kw h .080	S	2.50
Eureka, Cal.....	7,327	250b	5,000	67	4,000	96.00	§ 9.00		kw-h .200	S	¶ 2.00
Waukesha, Wis.....	7,419	150a	1,200	80	2,220	75.00	5.50		kw-h .175	S	2.40
Red Wing, Minn.....	7,525	50b	600	20	1,825	90.00	10.00	(1) 15.00	kw-h .200	S	4.00
Calais, Me.....	7,655	180	3,750	b 86	§	60.00	7.00	(3) 19.92	.520	W	
Jackson, Miss.....	7,816	300b		130	A. N.	114.00		kw-h .20	kw-h .150	S	1.80
White Plains, N. Y...	7,899	100b	4,000	25	4,000	100.00	8.00	20.00	kw-h .200	S	3.85
Bowling Green, Ky..	8,226	150b	3,000	82	3,250	48.78	4.50		kw-h .125	S	1.00
Plattsburg, N. Y.....	8,434	60b	4,800	55	2,920	90.00	6.20		kw-h .200	S & W	4.40
Murphysboro, ...	8,463	75	1,500	50	A. N.	120.00	6.40		.60 to 1.20	S	1.50
Long Branch, N. J...	8,872	200b	8,000	110	3,100	82.00	12.00		kw-h .200	S & G	3.25
Elyria, O.....	8,791	125b	2,500	100	A. N.	82.50	5.00		kw-h .090	S	1.75
Willimantic, Conn....	8,937	210	500	84	A. N.	97.32	5.00		(1) 1.000	S	3.60
Alliance, O.....	8,974	60b, 135a	3,000	60		54.00	a 4.00		kw .100	S	1.65
Lancaster, O.....	8,991	220b	700	100	4,000	85.00	5.00		kw-h .100	S	Nat. Gas
Brunswick, Ga.....	9,081	50b	3,500	46	4,015	84.00	8.00		kw-h .150	S	3.40
Champaign, Ill.....	9,098	200b	2,500	140	3,000	65.00	6.00	(1) hr .75	(1) hr .750	S	1.00
Keene, N. H.....	9,165	100b	6,000	60	A. N.	100.00			kw-h .175	W & S	4.35
Batavia, N. Y.....	9,180	120b	750				6.25		(1) .500	S	2.60
Paris, Tex.....	9,358	200a	6,800	100	2,800	84.00	9.00		kw-h .200	S	3.25
Hutchinson, Kan....	9,379	50b	3,200	34		100.00	8.00		kw-h .170	S	3.00
Hackensack, N. J.....	9,443		20,000	50	4,000	84.00		(2) 19.00	kw-h .150	S	2.60
Frankfort, Ky.....	9,487	95b	1,000	71	A. N.	96.00	6.50		(1) hr .750	S	2.35
Stevens Point, Wis...	9,524	150	1,300	72	†	78.00	4.50		kw-h .150	S	4.25
Escanaba, Mich.....	9,549	90b	2,000	63	†		6.50		(2) 1.300	S	2.50
Fargo, N. D.....	9,589	100b	7,000	67	A. N.	120.00	7.50	kw-h .15	kw-h .150	S	5.50
Carlisle, Pa.....	9,626	200b	4,300	74	A. N.	88.78	3.75		kw-h .125	S	2.60
Jefferson City, Mo....	9,664	90b	1,000	38	A. N.	65.00			(1) || .500	S	2.50
Anniston, Ala.....	9,695	100a	3,000	62	A. N.	75.00	kw-h .15			S	2.05
Bellaire, O.....	9,912	65a	2,750				5.00		(1) .250	S	1.10
Walla Walla, Wash...	10,049	85a	2,500	75	4,000	60.00	§ 11.00		kw-h .200	W & S	5.20
Johnstown, N. Y.....	10,130	100b, 565a		216	A. N.	88.46	a 11.00		kw-h .100	W & S	3.40
Bath, Me.....	10,477	85b, 30a	3,750	46	A. N.	$90 & 110	8.33		kw-h .160	S	Coke
Mankato, Minn.....	10,599	200a	2,500	60	A. N.	75.00	7.00	(2) 21.00	kw-h .150	S	2.20
Portsmouth, N. H.....	10,637	205a	1,650	108	4,000	112.50	6.00		kw-h .200	S	3.50
Helena, Mont.....	10,770	180a	12,000	79	A. N.	91.20	11.75	kw-h .14	(1) || 1.100	W	
Lawrence, Kan.....	10,862	75b	2,000	21	§	96.00	9.00		kw-h .150	W & S	3.00
Tiffin, O.....	10,989	200b	2,500	80	4,000	80.00	5.00	(1) 12.00	(1) .500	S	2.20
Pine Bluff, Ark.....	11,496	70b	4,000	7	A. N.	180.00	10.00	(4) 21.00	kw .200	S	3.00
Marshalltown, Ia.....	11,544	50a	4,000				7.00		meter .010	S	1,30
Fort Smith, Ark.....	11,587	35b, 70a	4,500				9.00		kw-h .150	S	.85
Denison, Tex.....	11,807	80b	5,000	54	A. N.	108.00	§ 10.00		kw-h .160	S	2.20
Greenville, S. C.....	11,860	120a	1,250	83	2,300	83.00	7.50		kw .100	S	2.85
Huntington, W. Va...	11,923	140b	1,500	83	A. N.	90.00	7.00		(1) .750	S	.85
Massillon, O.....	11,944	250b	6,000	160	A. N.	65.00	6.50			S	1.65

† Lighted by moonl scale. || To 10 P. M. § To 12 M. S Steam. W Water. a 1,200 candle-power. b 2,000 candle-power. * Oil, barrel. ¶ Wood, cord. A. A. All night. (1) 16 c. p. (2) 32 c. p. (3) 50 c. p. (4) 25 c. p. am-h Ampere-hour. kw-h Kilowatt-hour. G Gas engine. (From Brown's Directory of American Gas Companies. By courtesy of the publisher.)

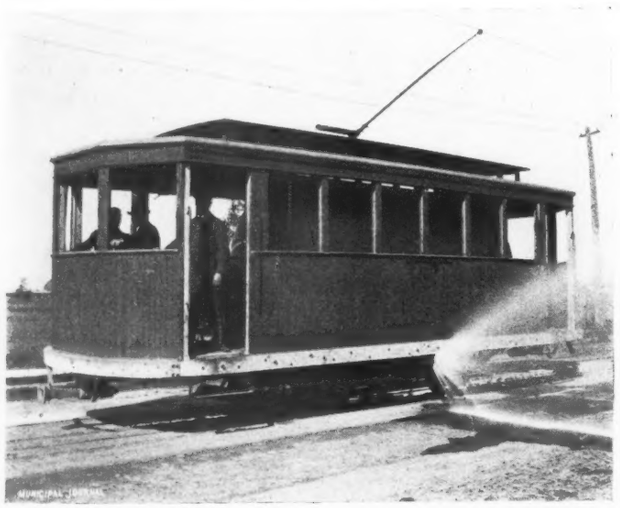
(Continued in February.)

AMONG THE MUNICIPAL WORKERS

The People Who Make the Modern City Possible—Information of Importance to City Officials and Others

A NEW ELECTRIC STREET SPRINKLER

It has often been asserted that street railway companies in return for the valuable franchises that they receive from cities should be compelled to sprinkle the streets in which they have their tracks. The continual alterations, etc., made necessary to keep the rails in condition, cause sand and dirt to lie loosely on the streets, and unless these are kept wet, are blown about by the wind, to the annoyance of pedestrians and occupants of neighboring houses.



A NEW STREETCAR SPRINKLER

But there are two ways of sprinkling a street, a good way and a bad. The bad way, which, unfortunately, is the usual way, is to pour a flood of water on the street so that a muddy river is the result. The right way to sprinkle a street is to allow but a fine spray to fall on the ground so that the surface is moistened only. Thus the dust is laid and pedestrians need not wade to their ankles in mud. A machine that will throw all kinds of streams, from a fine spray to a heavy flow for washing pavements, is what every city needs. The city authorities should see that the railway companies did not flood the streets except when flushing was necessary.

For those companies that desire to keep the streets in good order, or for those that are compelled to do so by the city fathers, the Studebaker Bros. Manufacturing Company, of South Bend, Ind., have designed an electric railway track and street sprinkling car combined, as shown in the accompanying half-tone.

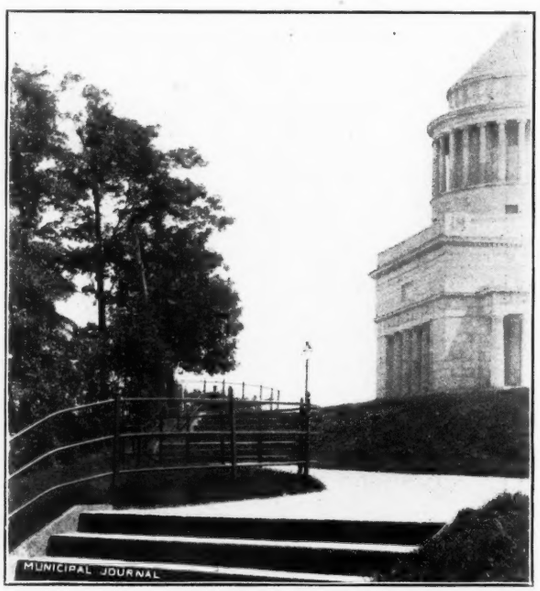
This car has to all outward appearances the resemblance to a large vestibuled baggage car, and it is equipped complete with motors, controllers, wiring, and the necessary switches required in use. At the sides are two sprinkler heads, the stream from which can be adjusted. A system of levers at each end of the car gives the operator perfect control of this apparatus, enabling him to grade the amount of water in the spray from the finest mist necessary for sweeping purposes to a heavy stream for flushing the track or laying the dust. There are two rotary pumps, each piped direct to the sprinkler heads and driven by a separate motor, which take the waste from the main tank and discharge it under pressure. A separate adjustment, easy of access to the operator, is used for flushing the track itself and sprinkling the right of way. Besides the uses enumerated, the sprinkler will be found convenient when it is desired to flush asphalt streets or similar pavements.

The company has aimed in building this machine to have a car and body suitable for all requirements, and, after many years of experience, has developed the one shown. The sprinkler heads used are fully covered by patents owned by the company, and contain many novel features. In some recent tests made on the Indiana street railway tracks, of South Bend, the street experimented on was sprinkled on each side of the track, the distance covered varying at the will of the operator from fifteen feet to sixty feet. The apparatus was at all times, even under the severest conditions, under perfect control of the operator, and the manufacturers were satisfied that its practicability was fully demonstrated. One of these sprinklers was also recently furnished for use at Colorado Springs.

IRON FENCING

Municipal Art Societies and many public spirited citizens are much interested nowadays in improving the appearance of municipalities. For this reason parks, public squares, monuments, etc., which require iron wire and netting fencing or pipe railing, are creating an unusual demand for fencing of an æsthetic type. What is known as the "Carpenter Patent Iron Fencing" is now being used in New York and many other cities. It is not only used by municipalities, but by many corporations and citizens.

The most important feature of an iron fence is the ground anchorage of its supports, and it has long since been conclusively proven that the "Carpenter" has the most practical and substantial anchorage yet



IRON FENCING AT GRANT'S TOMB

applied to a light iron fence post. The accompanying illustration shows the pipe railing at Grant's Tomb, Riverside Park, New York City. This railing is three feet high, very heavy and strong, and is extensively used throughout the parks in Greater New York. The manufacturer, Mr. F. E. Carpenter, 105 Park Place, New York City, is prepared to furnish estimates and prices upon all kinds of metal ornamental fencing, as well as wire and wrought iron tree guards, steel lawn settees, cast iron and steel hitching posts.

"THE FOUR-TRACK NEWS"

"THE Four-Track News" is the latest addition to New York Central Railroad literature. It is a neat, illustrated pamphlet published under the direction of George H. Daniels, General Passenger Agent, and resembles in form the publications of the "Four-Track Series," of which it is called a sequel.

"The Four-Track News" will be published monthly, and will contain timely notes of travel, interesting information relating to transportation and its development and brief notes on books of travel. An interesting item in the little book is the account of the growth of the New York Central Lines from 1831 to the present time. In that year the company owned seventeen miles of railroad, the primitive locomotive DeWitt Clinton and three Concord stages transformed into cars. The system now controls 10,453 miles of road.

Copies of "The Four-Track News" may be obtained from Mr. Daniels' office by sending a two-cent stamp.—*From the New York Tribune.*

TRADE NOTES

—The General Electric Company of New York has received a $750,000 contract to equip the trolley system of Tokio, Japan.

—The contract for supplying nearly $50,000 worth of meters to the city of Cleveland was recently awarded to the Neptune Meter Company.

—Mr. Samuel Harrison, formerly connected with the Hersey Meter Company, Boston, is now associated with the National Meter Company, of 86 Chambers street, New York City.

—Mr. D. W. Diggs, 141 Center street, New York, manufacturer of the well known Diggs Chimney-fire and Electric Wire Fire Extinguisher reports that he has been crowded with orders throughout the past year.

—Mr. William M. Deutsch, patentee of the Federal Filtration System, 141 Broadway, New York, has recently issued a neat eight-page folder containing a lot of illustrations and information which clearly set forth the value of this system.

—The Hays Manufacturing Company, of Erie, Pa., which was temporarily put out of business by a boiler explosion on October 9th, 1901, has reconstructed a better plant on the site of the old, and the company is now better equipped than ever with as perfect a brass foundry as can be constructed. "Lest you forget," writes the firm, "we remind you that we are at the old stand doing business."

—The Rife Hydraulic Engine is constructed by the Power Specialty Company, of 126 Liberty street, New York. A 16-page catalogue with illustrations and cover has recently been issuel. The Rife Hydraulic Engine, it is said, will pump more water than any other engine of its class. It is well adapted for use in small towns, irrigation purposes, railroad tanks, factories, country residences, stock farms and creameries.

—The Mayor of Covington, Ky., W. A. Johnson, is so popular with the fire department of his city that a large hook and ladder truck, recently added to the department, has been named after him. This particular truck was made by the Seagrave Company, of Columbus, O. It carries 400 feet of ladders, is equipped with rear steering gear and rubber tires. It is finished in natural wood and the frame is painted white with gold and color decorations.

—In a competitive test at Beaumont, Texas, recently, "Thurber brick" stood the highest in crushing, abrasion and absorption, resulting in having these brick specified in the contract lately awarded by that city to the Texas & Pacific Coal Company, manufacturers of the Thurber brick. This company has made, within the last thirty days, two of the largest brick sales ever known in Texas; one in Houston, for 2,225,000, and a second in Beaumont for about 2,000,000 brick.

—The Hayward Company, of 97 Cedar street, New York, has just issued a handsome 84-page illustrated catalogue with cover descriptive of its digging machinery. The Hayward company manufacture what is known as the "Orange Peel" Buckets, Railroad Excavators, Steel Travelling Derricks, Coal Handling Machinery, "Clam Shell" Buckets, Dredges, Skid Excavators and Derrick Fixtures. This catalogue is copyrighted, is well worth having and can be had for the asking.

—Through a change of illustrations at the last minute before going to press and a consequent shifting of "captions" the wrong title was placed under the first cut on page 261 of our December issue. Instead of "Dromedary concrete mixer loading," the caption should have read, "Concrete mixer loading." The Dromedary mixer requires no cars, track, scaffolding or elevating machinery. As was shown in the article of last month, the Dromedary mixer performed the most satisfactory work in connection with the construction of the conduits in Baltimore. By referring to the advertisement of the Fisher & Saxton Co., elsewhere in this number, the manner of operating this mixer will be clearly shown.

—Eight pages of the December number of *The Successful American* are devoted to biographical sketches of William and Albert Scherzer. The former was the inventor and patentee of the Scherzer Rolling Lift Bridges, and the latter is the president and chief engineer of the company. Mr. William Scherzer died shortly after completing his invention, in 1893. At that time his brother, Mr. Albert Scherzer, was practicing law in the city of Chicago, but he was obliged to abandon his chosen profession for the purpose of carrying on the business so successfully inaugurated. To further his purpose he immediately started upon an extensive course of study in bridge construction, particularly of the moveable type, which involved much travel in America and Europe. The main offices of this company are at Chicago, but branch offices are established elsewhere in the leading cities throughout the world, the business of the company being protected by numerous patents.

—Rock asphalt is particularly adapted for use in southern climates, and at the same time it gives excellent satisfaction in northern cities. A large contract was recently awarded the Green River Asphalt Company, of St. Louis, for sheet asphalt to be laid in Mobile, Ala. The asphalt used for this work is known as the Kentucky rock asphalt. It is a silica sandstone impregnated with about 12 per cent. of pure asphalt. It is quarried in large rocks, then crushed and pulverized and shipped to points where it is to be used. This product is heated by a steam and hot air process, known only to the Green River Company. Carbonate of lime is mixed with it, the amount being governed by the per cent. of asphalt in the rock, which has a hardening effect. It is laid similarly to all other asphalts, except that it requires no binder, it being laid two inches thick on a concrete base. It will not soften in summer. It is said to be as hard as steel and as smooth as glass both winter and summer. One who has had long experience with rock asphalt, says: "It improves with age and traffic, becoming harder and harder as time passes."

THE DROMEDARY MIXER

READY TO LOAD

This well known mixer was developed on conduit-electric railway construction in Washington, D. C., some years ago. At that time concrete was made with shovels and hoes on platforms which rolled upon a track; cement was distributed in small piles along the sidewalk; sand, gravel and stone were received on the cross streets, and water cars ran on the track between the mixing platforms, of which from two to four were usually working together. The sand, stone, etc., were wheeled in barrows to the mixing platforms from which the concrete was cast directly into place.

"Necessity being the mother of invention," it was not long after dromedary mixer came into existence. The accompanying illustration shows the dromedary ready to load and how simple it is in construction. There is nothing complicated to get out of order. It does its work thoroughly and rapidly. The daily output of a dromedary mixer is from 25 to 35 cubic yards of concrete (measured after it has been rammed in place), according to the conditions and management under which it works. There is never any question about the quality of its work. A thorough incorporation of the materials and a rubbing of every stone with a coating of mortar is guaranteed. No mixer surpasses it in the quality of its work, and none, we think, can compare with it in the ease with which it is handled and moved about, or in the returns it will give for the moderate investment involved on street railway work, duct lines, curb setting, pole setting, cement sidewalks, pavement foundation and almost any other concrete work.

It is easy to load. Shovels or, preferably, sand scoops, are used in loading directly from the piles of materials on the street. An illustrated folder and catalogue will be forwarded to any address by the manufacturers, The Fisher & Saxton Co., 123 G St., N. E., Washington, D. C.

SOME MUNICIPAL USES OF CEMENT IN NEW YORK

THE most interesting development in modern engineering within the past decade has been the more general use of cement and concrete, and the growing use of cement mortars. The technical and scientific papers are full of descriptions of bridges, tunnels, buildings, mills, etc., built entirely of concrete, with various forms of expanded metal and other construction, which contain, also, many other accounts of the introduction of cement and concrete in the manufacture of conduits, tubes, and other engineering materials.

A point that has not yet come up, but which has always been one of doubt in the engineering mind, has been as to the solidity and monolithic character of the work so done, and a recent feat performed by the engineers of the Rapid Transit in New York, has once for all demonstrated the homogeneity, solidity and monolithic character of concrete work and work done with cement mortar.

PREPARING TO MOVE THE WALL.

THE FEAT ACCOMPLISHED.

Under the original specifications for the construction of the Rapid Transit work, two tracks were called for, for that portion of the work north of One Hundred and Twenty-fifth street. Subsequently, a change in the specifications was made, and it was decided to extend three tracks from One Hundred and Twenty-fifth street to One Hundred and Forty-fifth street. At the period that this change was ordered, a great portion of the masonry had been done, forming the approaches to the tunnel, which is part of the work in question. This masonry consisted of two walls 192 feet in length, varying in height from 3 feet at the south to 15 feet at the north. They were built of concrete, with a pressed brick facing. In the concrete, natural cement ("Union" brand) was used, mixed in the proportions of 1 part cement to 2½ parts sand, and 5 parts broken stone. The brick facing (8 inches in thickness) was laid up in Portland cement ("Giant" brand) mortar, of 1 part cement to 2 parts sand. The brick was laid in Flemish bond, the tails of the headers bonding into the concrete back.

In order to make the changes, these two walls flanking the tunnel had to be moved back to make room for the additional track. The walls were already nearing completion, and to tear them down meant the destruction of the work of many months. To avoid the waste of all the time and money employed in the construction of the walls, it was decided to perform an engineering feat never before attempted, and which demonstrated, as already explained, a new use and a new strength of concrete and of cement mortars. Excavations were made back of and beneath the walls, and then steel straps were inserted extending back 5½ feet. By means of powerful jacks, the walls were raised and slid back upon the straps, which were then withdrawn and the walls anchored with cement.

The whole work was moved back a distance of 5½ feet on each side to accommodate the third track. The removal of the work on the west wall was finished on October 15, 1901, and the east wall on October 25, 1901, and the whole work finished without any injury to the masonry or concrete. By reason of this enlargement, it will be possible to run express trains all the way up to One Hundred and Forty-fifth street.

To the engineering and cement interests, the successful moving of this enormous mass of concrete and brick work without break or fracture will prove interesting and will no doubt open up many new uses for cement and concrete.

RECENT INVENTIONS

FOREIGN

11,111—*Purifying Water.* A. J. Boult, London, England.
11,263—*Electric Street Lamps.* H. Hirst, London, England.
11,510—*Water Waste Preventers.* E. Grube and H. C. M. Sanny, Hamburg, Germany.
12,186—*Method of Treating and Filtering Sewage.* S. H. Adams, Harrowgate, England.
12,581—*Street Gas Lighting.* H. Talbot, Surrey, England.
13,168.—*Concrete Paving.* J. Ward, Grange-over-Sands, Lancashire, England.
13,282.—*Building-blocks; Walls.* H. G. B. Brunckhorst, Hamburg, Germany.
13,309.—*School Desks and Seats.* J. Chisholm and J. Don, London.
13,363.—*Roads, Making.* J. Behmer, Eskiltuna, Sweden.
13,425.—*Smoke-Consuming.* F. Schlobach, Leipzig, Germany.
13,703.—*Water-Waste Preventers.* R. Chantry and H. C. Millbank, London.
13,752.—*Sewage; Treating, &c.* O. Freysoldt, Stettin, Germany.
13,879.—*Voting-Apparatus.* A. A. Farwell, Harrison Hot Springs, British Columbia.
19,999—*Fire Alarms.* H. G. Lyngaas, Trondhjem, Norway.

AMERICAN

684,812—*Street Sweeper.* Pierre Haerst, Chicago, Ill.
684,964—*Car Fender.* George W. Webb, St. Louis, Mo.
685,143—*Fireproof Floor.* Sigurd Höyer-Ellefsen, Christiania, Norway.
685,304—*Gas Attachment for Compressed Air Fire Extinguishers.* R. B. Sigafoos, Racine, Wis.
685,323—*Elevated Carrier or Conveyer.* Leander Clark, Greenville, Ohio.
685,384—*Road Grading Machine.* Thomas McDonald, Lancaster, Wis.
685,380—*Fireproof Blind.* William R. Kinnear, Columbus, Ohio.
685,512—*Method of Treating Nernst Lamp Glowers.* Marshall W. Hauks, Pittsburg, Pa., assignor to George Westinghouse, Pittsburg, Pa.
685,586—*Fire Extinguisher.* Edgar H. Ellis, Brooklyn, N. Y.
685,599—*Street-Cleaning Device.* Andrew M. Grey, Newark, N. J.
685,657—*Road Scraper and Grader.* William J. Walker and James H. Osten, White City, Kan.
685,681—*Attachment for Rubbish Carts.* Edward Hasey, Boston, Mass.
685,724—*Method of Electric Lighting.* Walther Nernst, Göttingen, Germany, assignor to George Westinghouse, Pittsburg, Pa.
685,725—*Electric Glow Lamp.* Walther Nernst, Göttingen, Germany, assignor to George Westinghouse, Pittsburg, Pa.
685,745—*Automatic Fire Alarm.* Bescherrer A. Crisman, St. Elmo, Tenn.
675,864—*Smoke-Consuming Stove.* Henry Perfett, Ipswich, Eng.
685,914—*Mail-Box.* Primus W. Fromhold, Kansas City, Mo.
686,002—*System of Drainage, Sewerage, or the Like.* Joseph P. Monty, Sandyhill, N. Y.
686,038—*Sand Reel for Artesian Wells.* Hiram W. Eaton, Jr., and Andrew Benson, Bradford, Pa.
686,169—*Car Fender.* William P. Tucker, Brooklyn, N. Y.
686,182—*Fire-Escape.* Hattie L. Wright, Pittsburg, Pa.
686,183—*Fire Extinguisher.* Fernando Yost, Rutherford, N. J., assignor to Jay W. Walkins, New York, N. Y.
686,328—*Mail-Box Attachment.* John L. Plank, Rochester, N. Y.
686,341—*Apparatus for Maintaining the Water Level in Reservoirs.* George I. Rockwood, Worcester, Mass.
686,355—*Torch for Lighting Gas Lamps.* John M. Simmance and Jacques Abady, London, England.
686,419—*Conduit for Electric Wires.* Emmett D. Page, Brooklyn, N. Y., assignor of one-half to George A. Lutz, New York, N. Y.
686,458—*Fire-Escape.* Isaac R. Johnson, Newport, R. I.

ANOTHER SUGGESTED STREET SIGN

THE New York City authorities are still open for suggestions on street signs, and, while many designs have been suggested, none seem to "fill the bill." And yet it is necessary that some good design be adopted soon, for the need of such in the city is great. Now that electric lights have been substituted for the old gas lamps, the signs that were on them have, in many cases, disappeared. Even persons that know their way about the town are sometimes at a loss for the name of a street, especially at night. Unless one keeps track of the streets as he passes in a car, it is often hard to tell just "where he is at."

A sign that is available for use on electric light posts so that the light will illuminate it at night has been submitted by Mr. C. S. Knight, a well-known electrician. The sign shown in Fig. 1 is in use at the corner of Broadway and Barclay street, New York City. In Fig. 2 it is shown in position for service. In Fig. 3 it is shown as thrown up out of the way when the lamp is being cleaned. The letters are of opal glass, white, and can be seen a long way off both day and night. The structural material is of sheet metal, and the whole weighs three pounds.

This is the only practical street sign yet designed for use with arc lamps, and it supplies a long felt want in this particular. Efforts are now being made in the larger cities to install these signs.

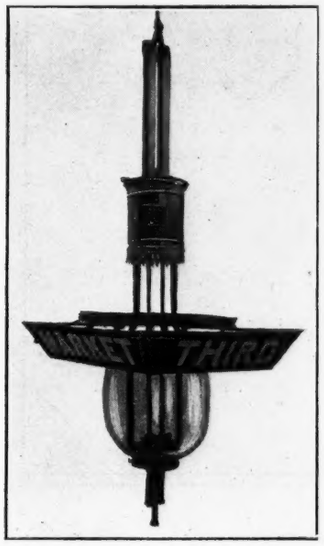


FIG. 2. SIGN IN PLACE

FIG. 1. SIGN BROADWAY AND BARCLAY STREET

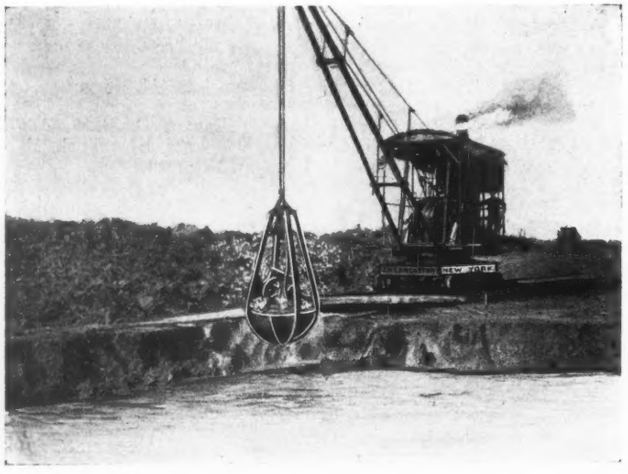
FIG. 3. LAMP READY FOR TRIMMING

THE LANCASTER COMBINATION HOISTER AT WORK

THE development of mechanical appliances to be employed in construction work of all kinds, particularly in excavations, dredging, hoisting, etc., has been one of the wonders of the past quarter of a century. This kind of apparatus, it would seem, has reached perfection, or, at least, leaves small chance for improvement. The "Lancaster" Combination Hoister is now in operation in hundreds of places throughout the country, many being used by the United States Government. Contractors and bridge builders find the "Lancaster" indispensable and many are in use in other countries, including Central and South America and Canada.

To the layman who watches one of these machines at work it seems almost human in its operations. It is so perfect in its construction and so easily adapted to varying conditions and uses, that the ordinary observer is puzzled to understand how a purely mechanical contrivance can perform work of this character so rapidly and satisfactorily. But to the operator, whose intelligence directs the movements of the machine, it is as clear as sunlight.

This new hoister is made in three sizes, and operates independently either as a "Lancaster" grapple, clam-shell bucket or shovel, or as a traveling steam crane. With the addition of a simple guide attachment it becomes an efficient 30-foot steam pile driver. And it only re-



THE LANCASTER AT WORK AT NORFOLK

quires the short space of thirty minutes to so change it that it can be adapted to its various uses.

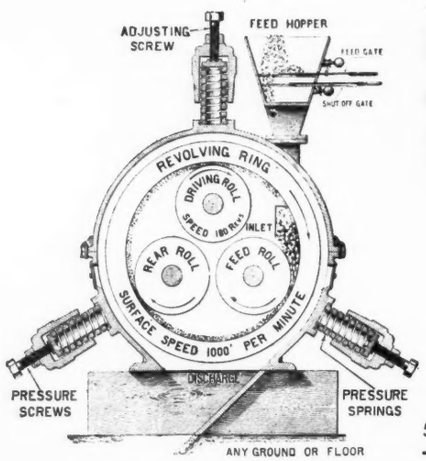
These machines revolve the entire circle on a turntable, are adjustably balanced and self-propelling in either direction. The 9-inch by 12-inch double cylinder, double drum machine works a grapple of 1½-cubic yards capacity on a 30-foot boom, a 1¼-yards capacity on a 25-foot boom, a 1-cubic yard capacity on a 30-foot boom, and a ¾-yard grapple or bucket on a 35-foot boom. It also operates a 1-cubic yard dipper or shovel, and a load of six tons as a steam crane. It runs on standard 4 feet 8½- inch railroad rails, or on special rollers. The wheels and rollers are also adjustable on their axles for running upon 12-inch by 12-inch timbers of either 8-foot or 10-foot gauge.

It has an automatic derricking attachment for raising and lowering the boom and load while swinging or operating the grapple, and rapidly digs and delivers the material anywhere inside the extreme radial reach of the boom used. Winch-heads are provided on the truck, for ploughing, hauling cars or pulling stumps. The wheels and axles may be dispensed with and the hoister readily transferred to and worked from the deck of a scow or from a pier or stationary platform.

It is housed in with corrugated iron, and the boom, frame and truck are all of steel and constructed in the most substantial and perfect manner. These new and improved combination hoisters possess many novel and important features hitherto unknown. Blocking up beams are provided at both front and rear ends of truck, which slide laterally to a width of fourteen feet, for steadying the machine under extreme loads. These machines are also built to swing the boom only, thus operating the grapple or bucket within only half a circle instead of the complete circle.

These grapples, buckets and dredges dig solid earth, gravel, placer dirt, clay, mud, sand, ore, coal, phosphate, hard-pan, etc., with great ease and rapidity. About two hundred of the "Lancaster" double line, four-blade grapples and clam-shell buckets are in successful use throughout the country, and accomplishing work of the most varied and difficult nature. Further particulars can be had by addressing James H. Lancaster, 123 Liberty street, New York.

The accompanying illustration shows the machine at work for the Degnon McLean Contracting Company, digging the canal at Norfolk, Va. A similar machine is in use at Bocus del Torro, Central America, on the Panama Canal.



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